

FIG. 1

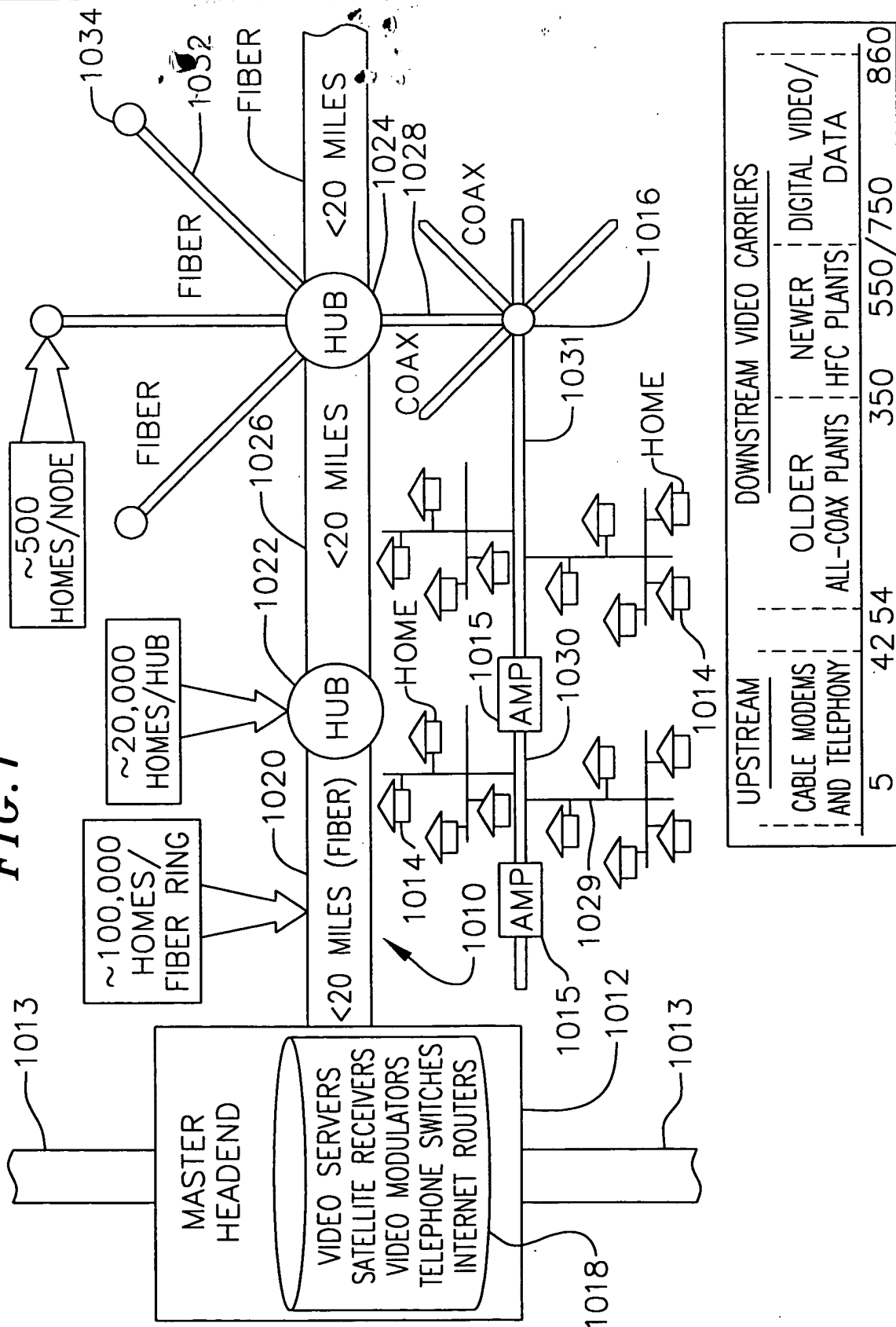


FIG.2

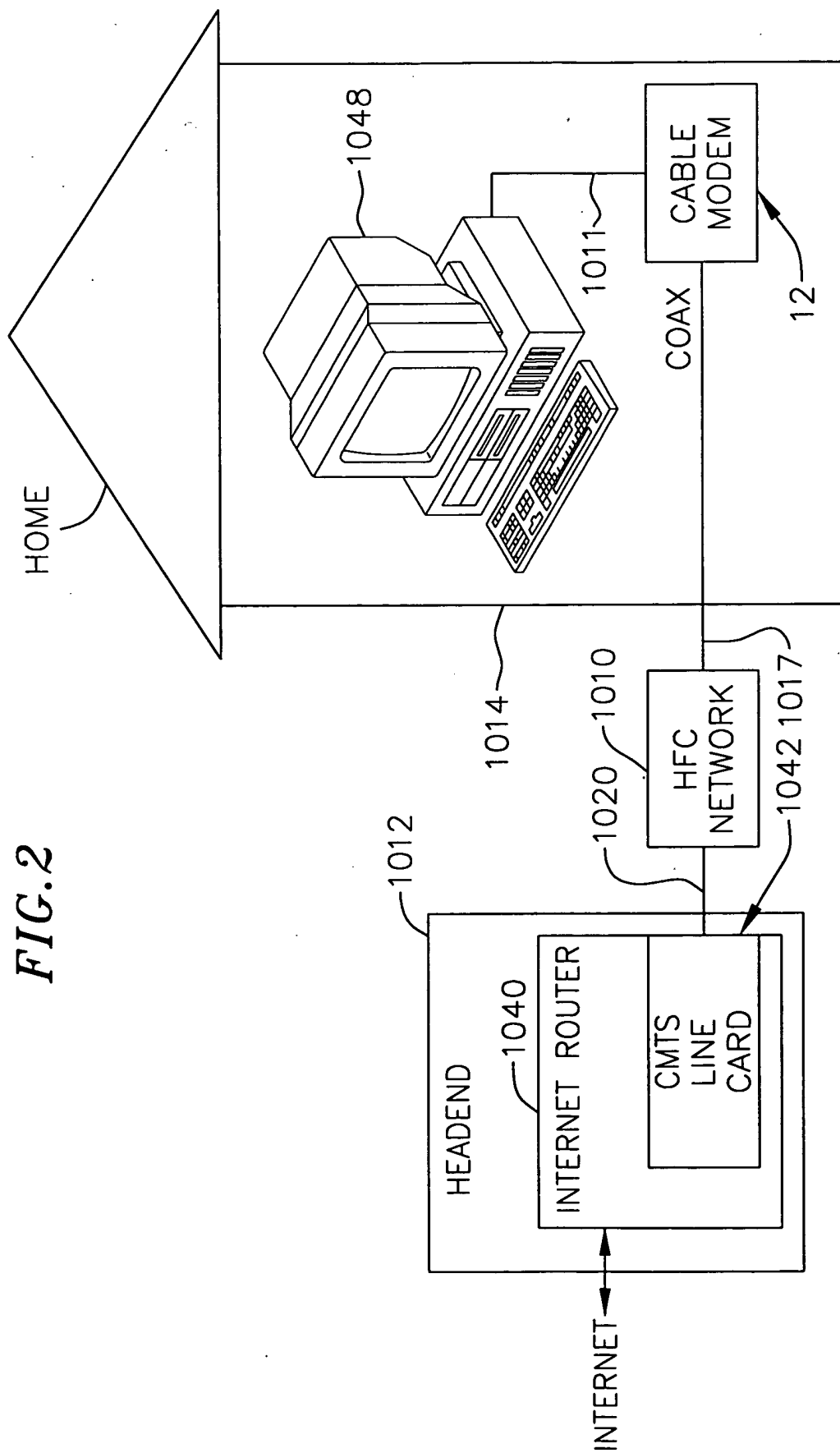


FIG. 3

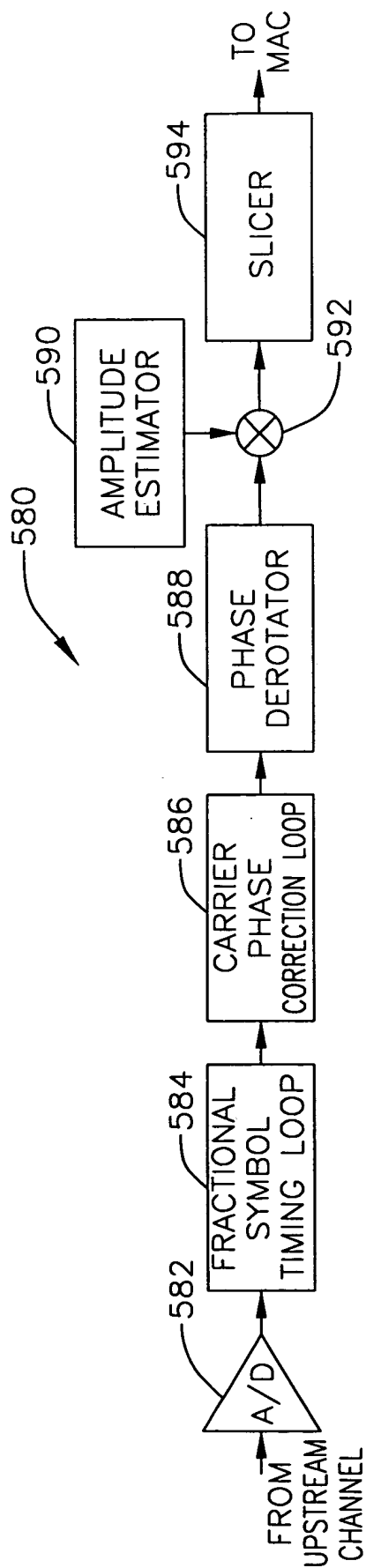


FIG. 5A

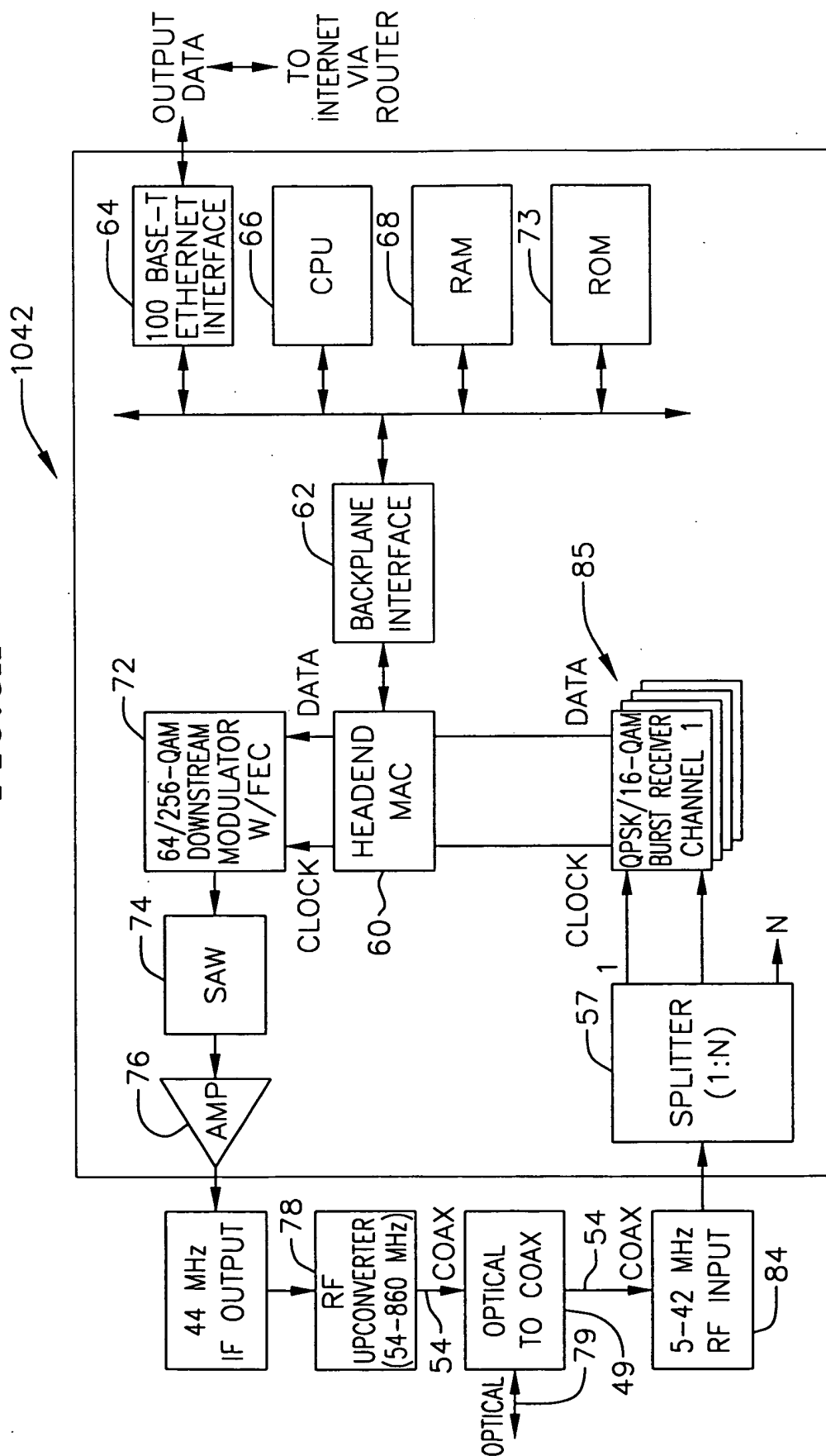


FIG. 5B

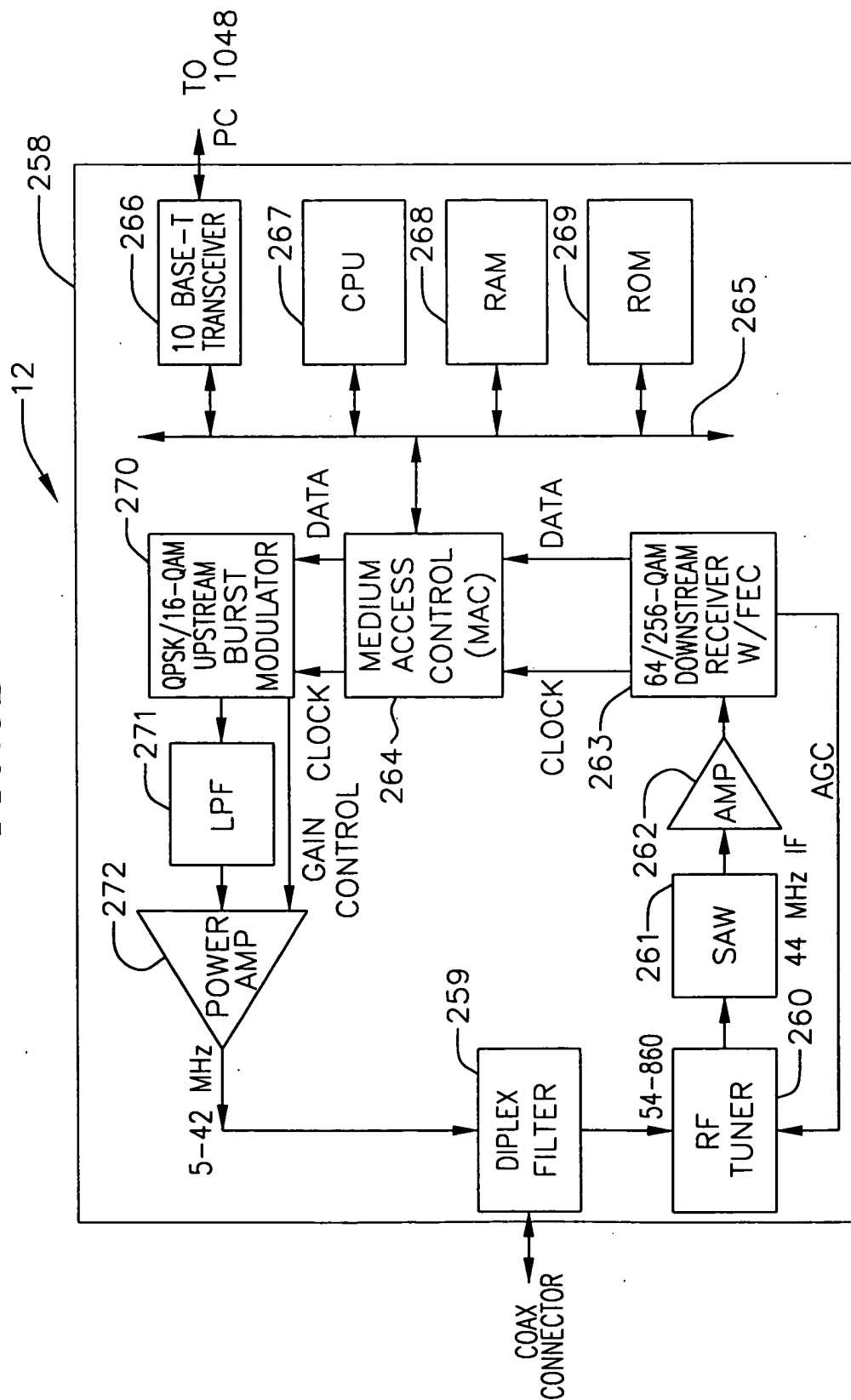


FIG. 6B

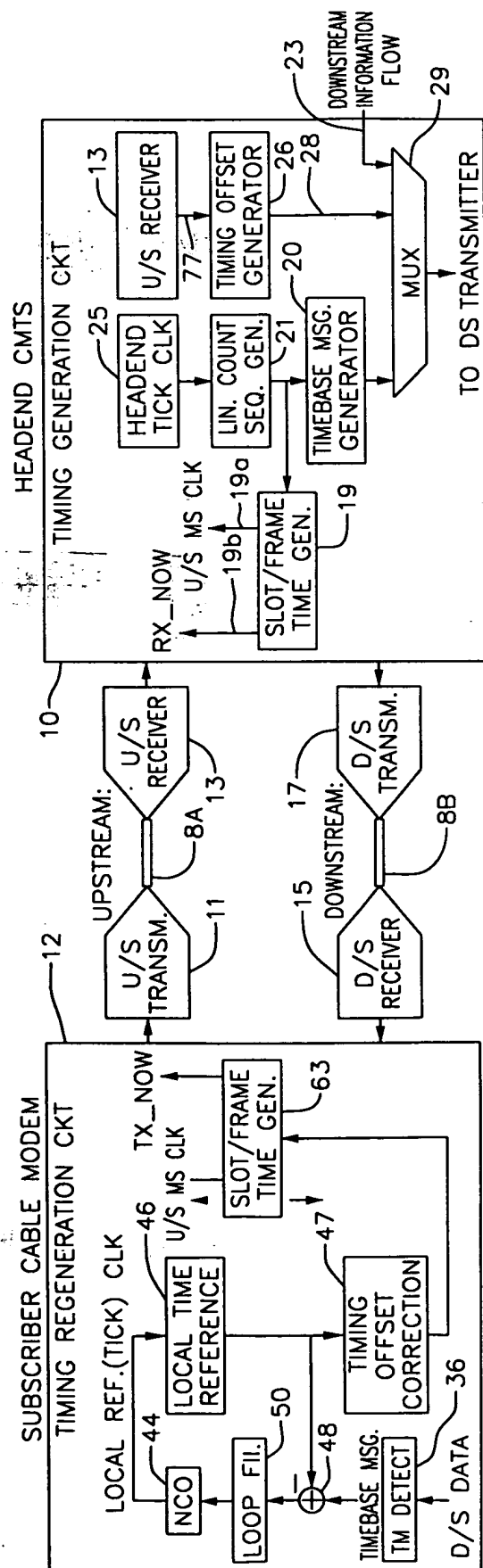


FIG. 6A

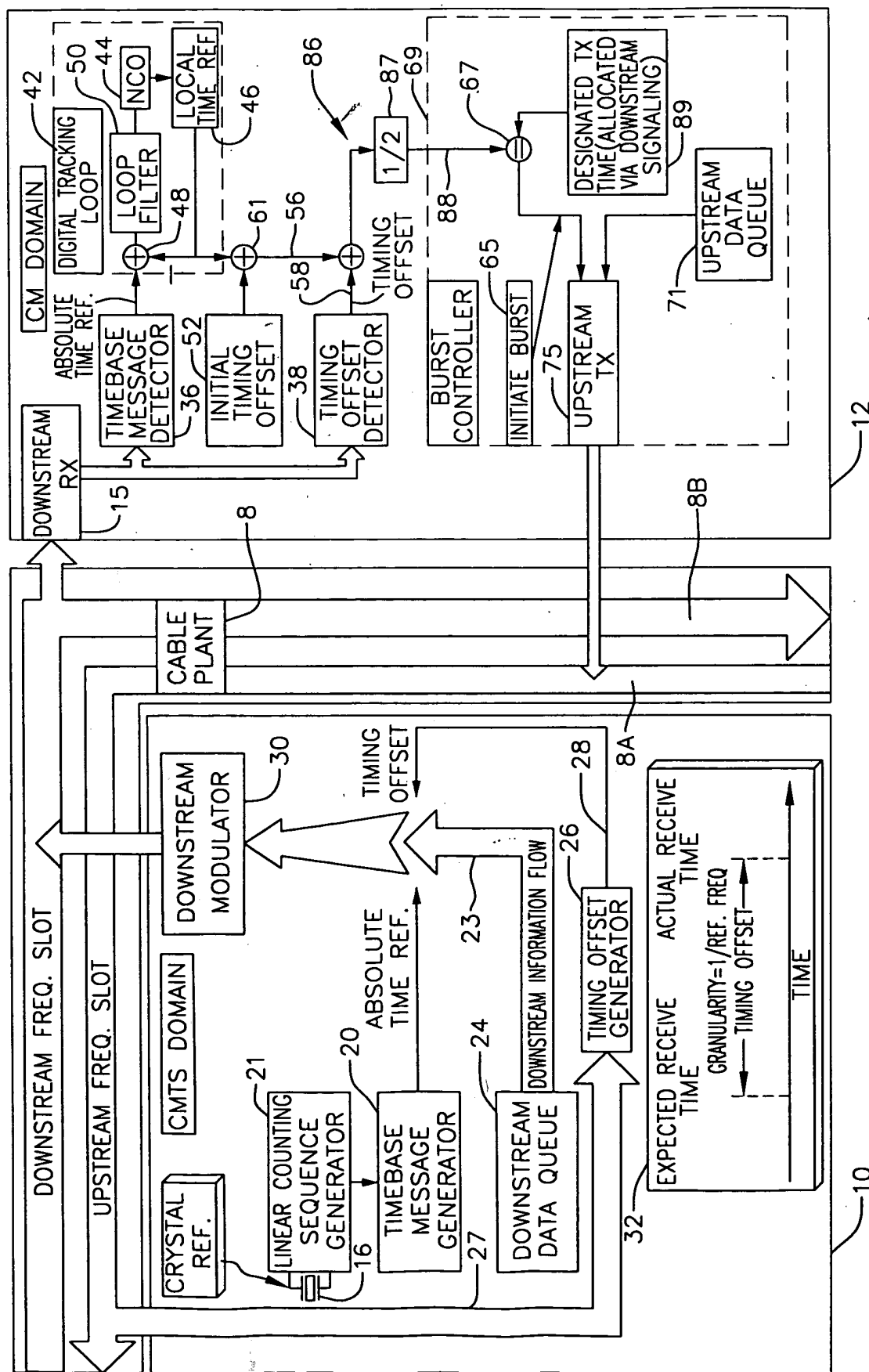
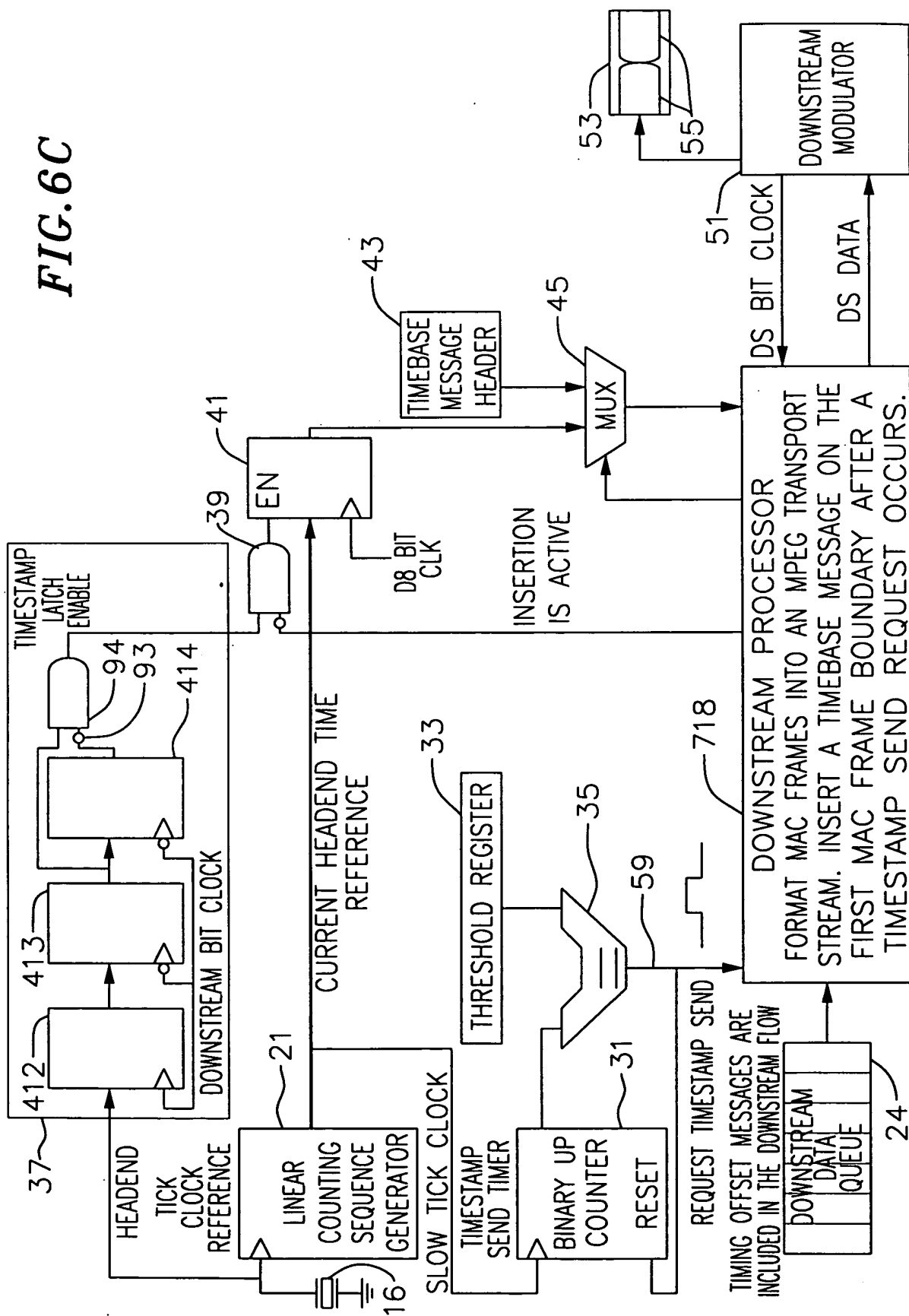
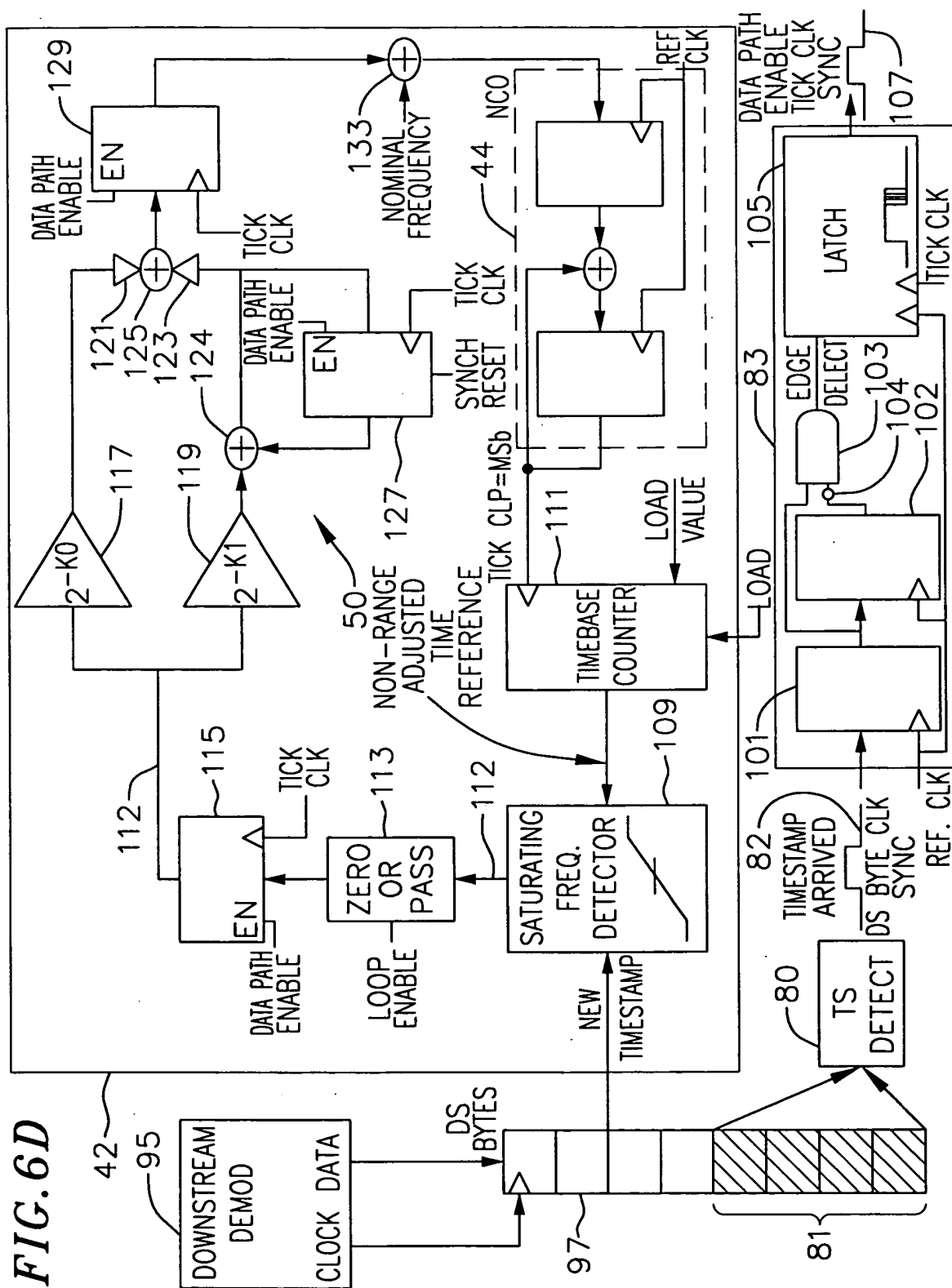


FIG. 6C



[illegible]

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	

UPDATE RATE	COARSE COEFFS	FINE COEFFICIENTS
1kHz(1ms)	$K0=2^{-11}$ $K1=2^{-15}$ (BW=50Hz)	$K0=2^{-16}$ $K1=2^{-25}$ (BW=1Hz)
300Hz(3.3ms)	$K0=2^{-12}$ $K1=2^{-15}$ (BW=20Hz)	$K0=2^{-16}$ $K1=2^{-23}$ (BW=1Hz)
100Hz(10ms)	$K0=2^{-13}$ $K1=2^{-16}$ (BW=10Hz)	$K0=2^{-16}$ $K1=2^{-22}$ (BW=1Hz)
50Hz(20ms)	$K0=2^{-14}$ $K1=2^{-17}$ (BW=5Hz)	$K0=2^{-16}$ $K1=2^{-21}$ (BW=1Hz)
30Hz(33ms)	$K0=2^{-15}$ $K1=2^{-18}$ (BW=3Hz)	$K0=2^{-17}$ $K1=2^{-21}$ (BW=1Hz)
10Hz(100ms)	$K0=2^{-17}$ $K1=2^{-20}$ (BW=1Hz)	$K0=2^{-17}$ $K1=2^{-20}$ (BW=1Hz)
5Hz(200ms)	$K0=2^{-18}$ $K1=2^{-20}$ (BW=1Hz)	$K0=2^{-18}$ $K1=2^{-20}$ (BW=1Hz)

FIG. 7B

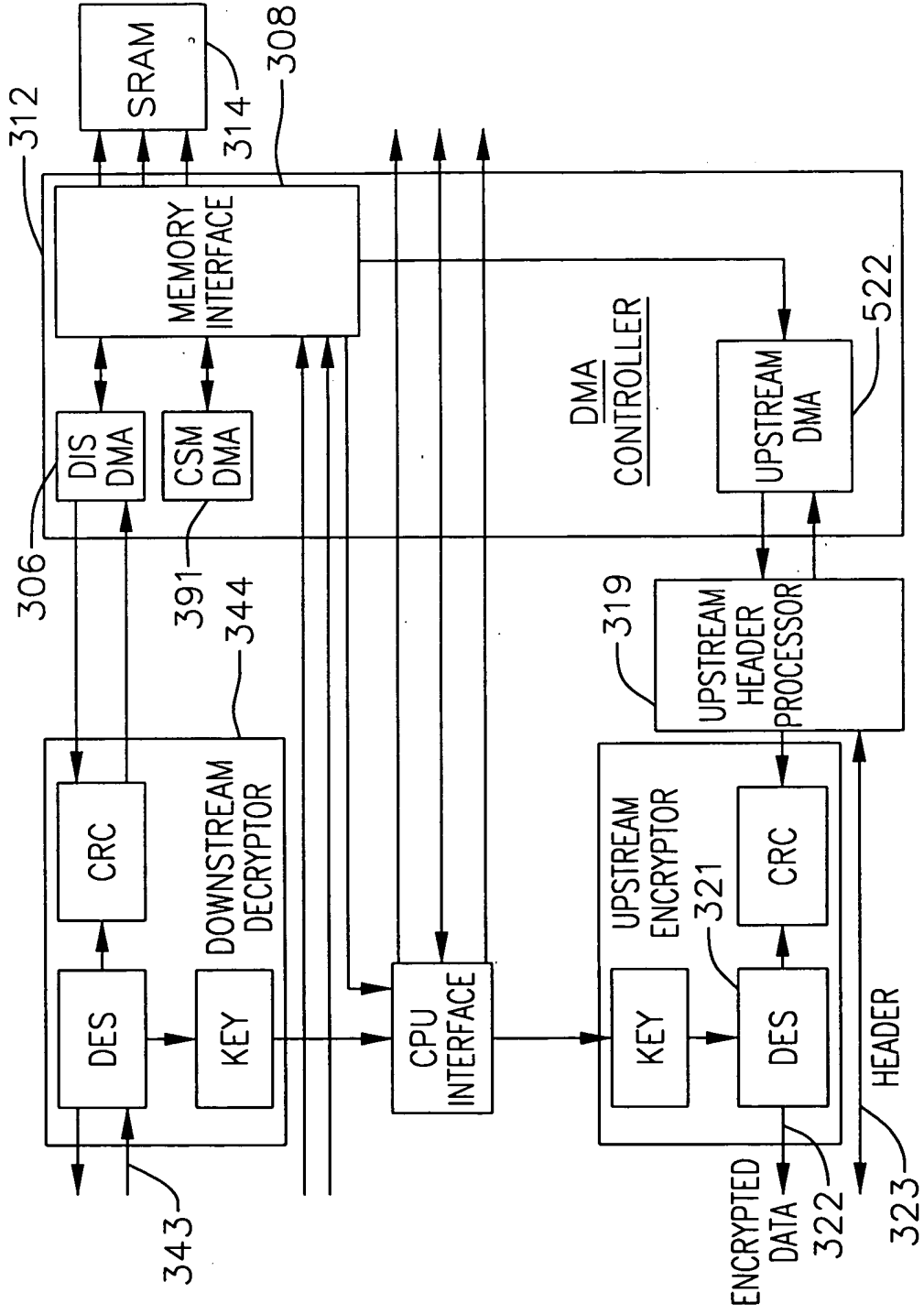


FIG. 8A

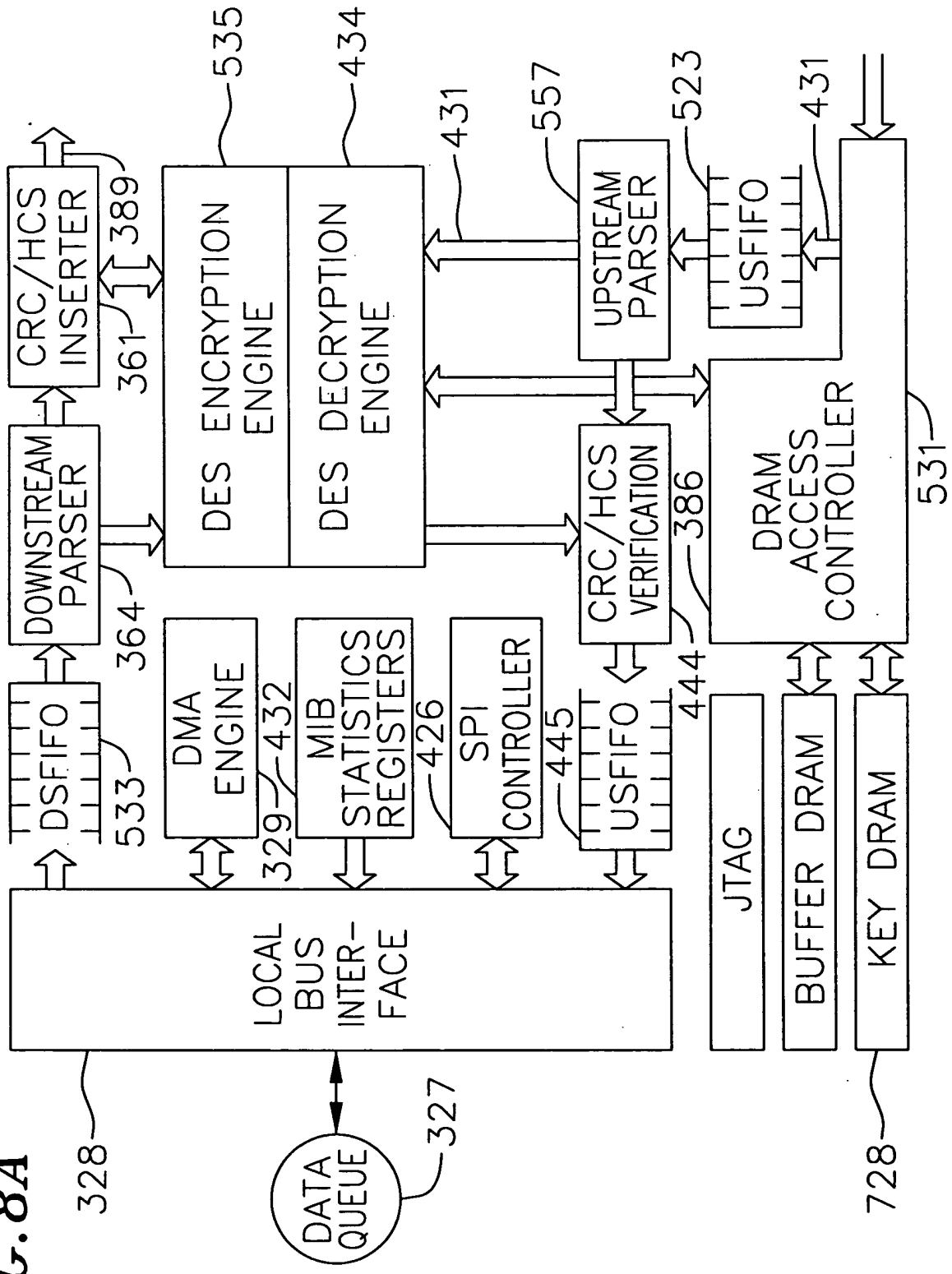


FIG. 8B

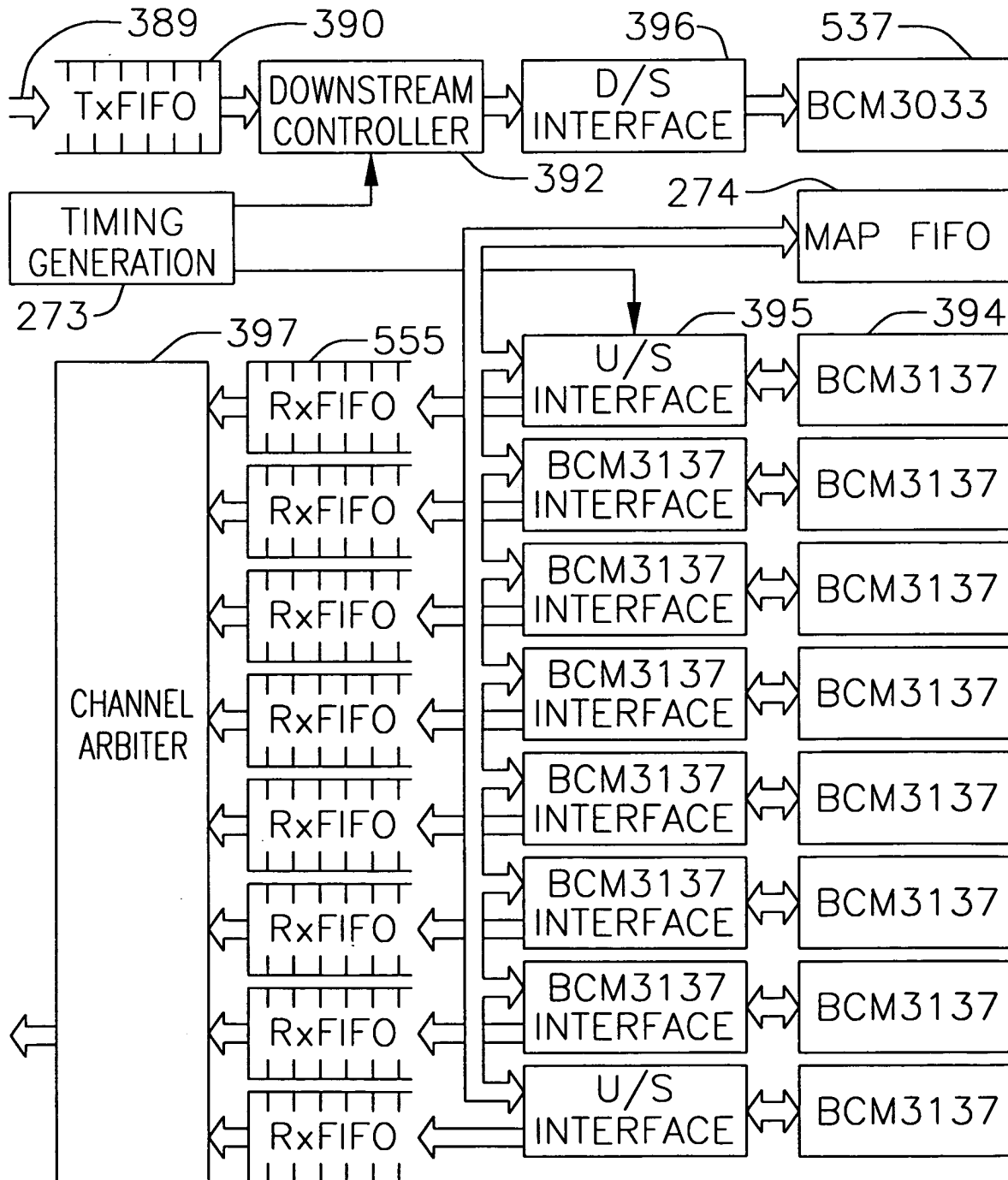


FIG. 9

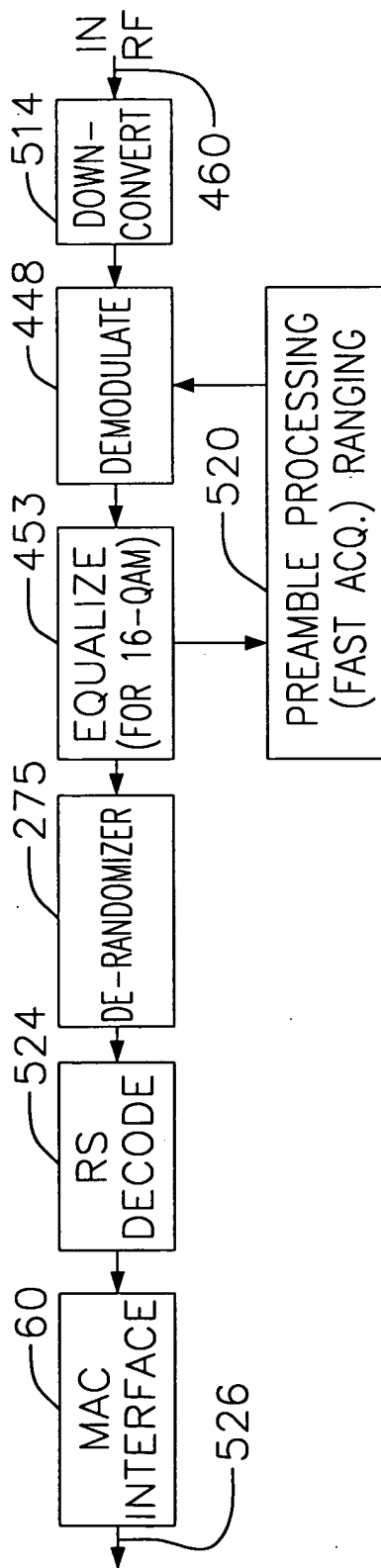


FIG. 10

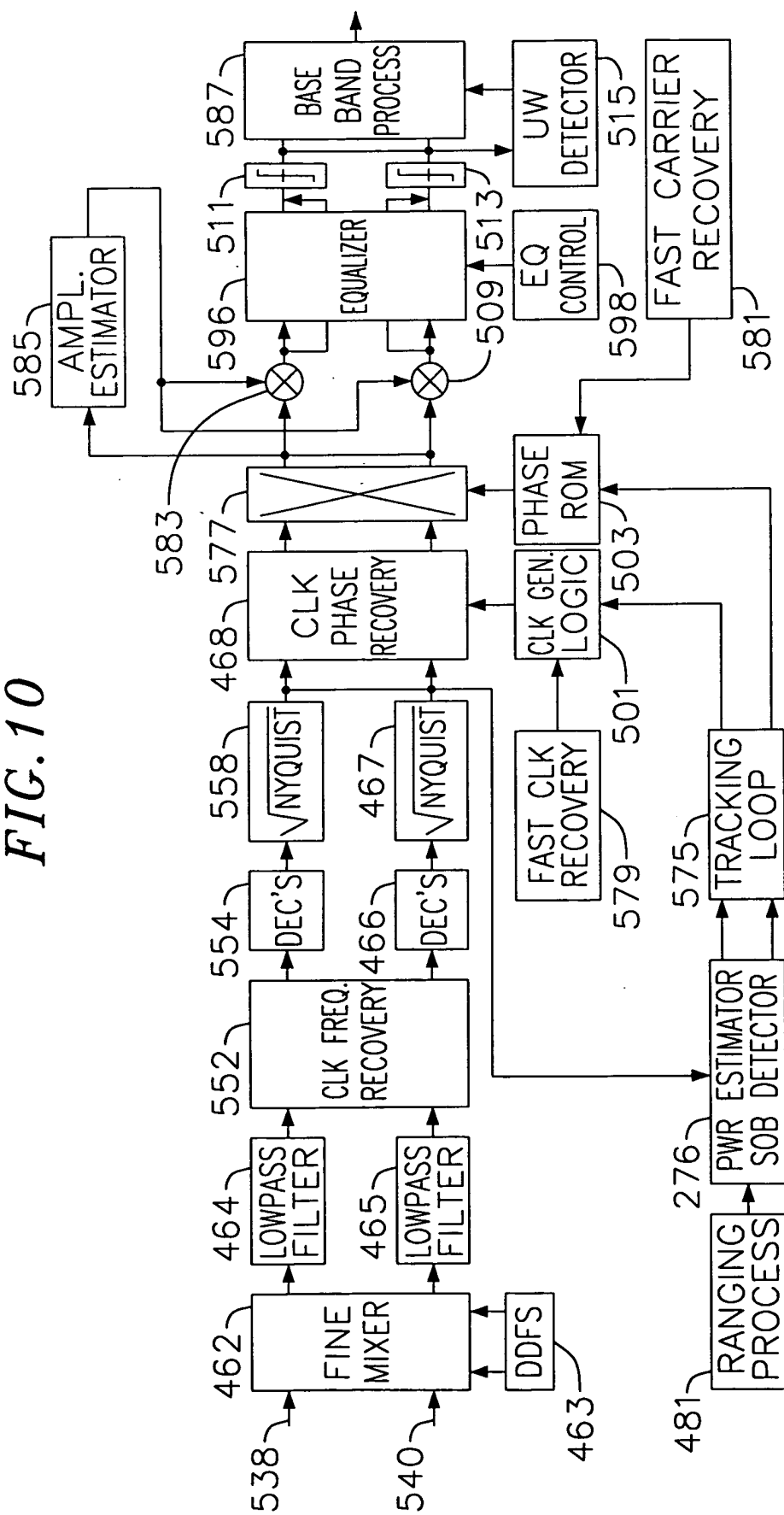


FIG. 11

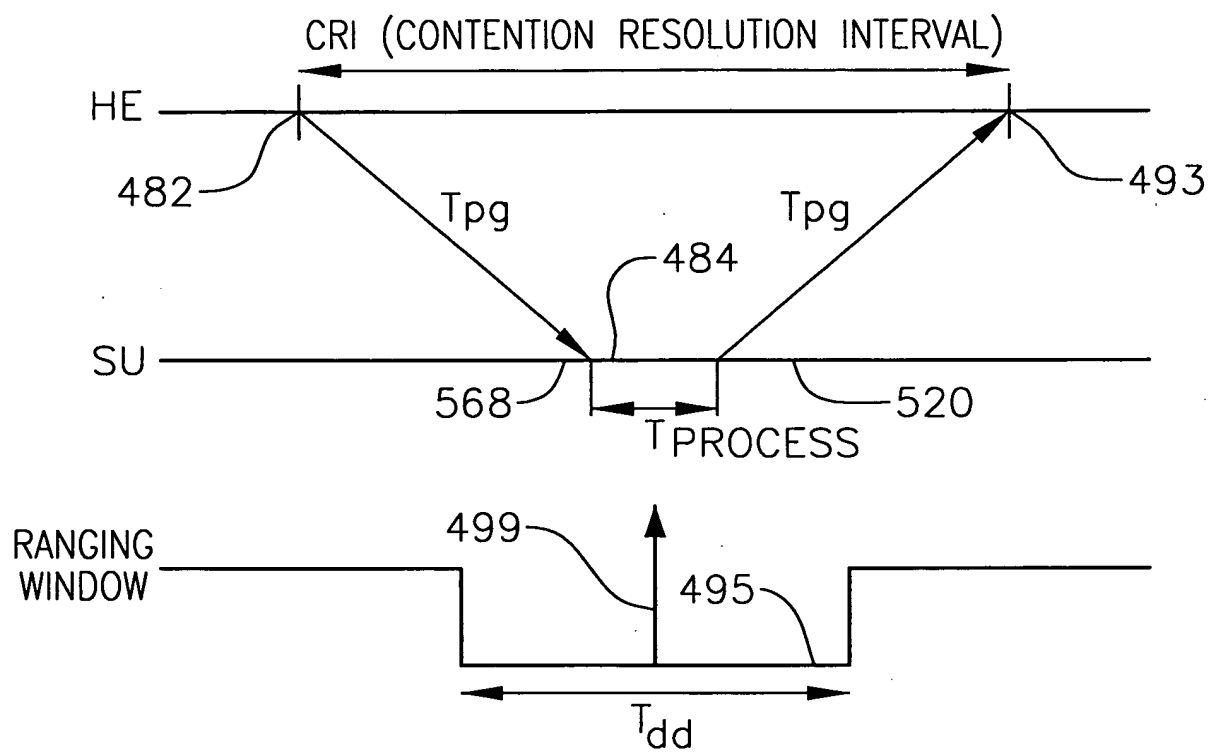


FIG. 12

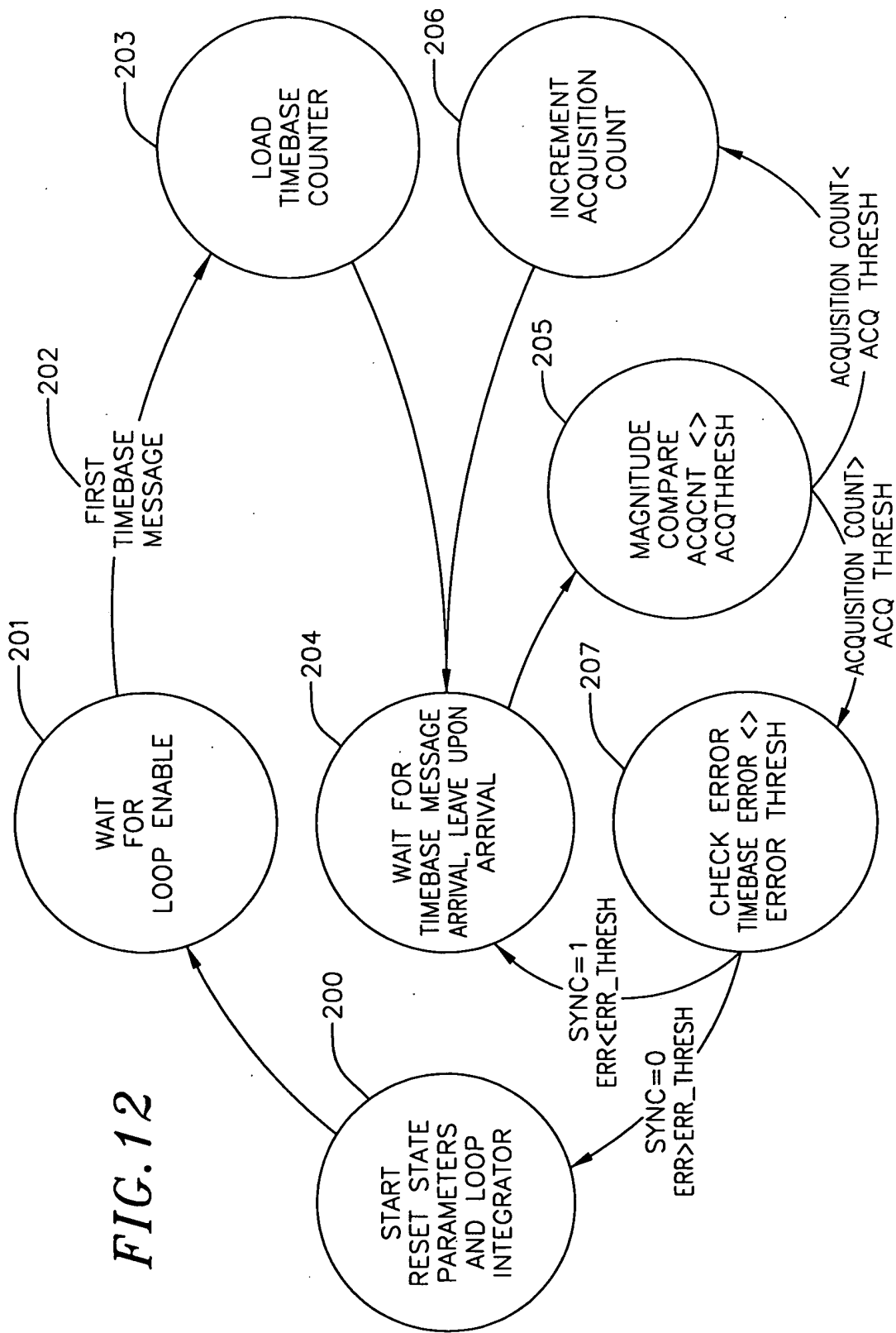


FIG. 14

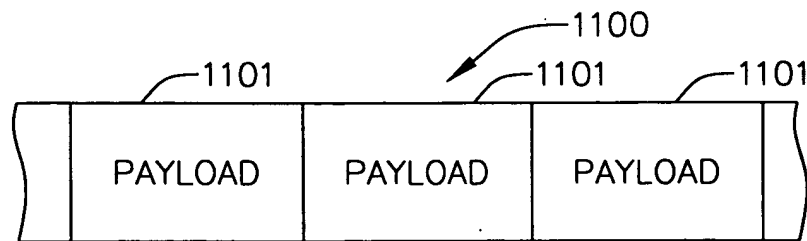


FIG. 15

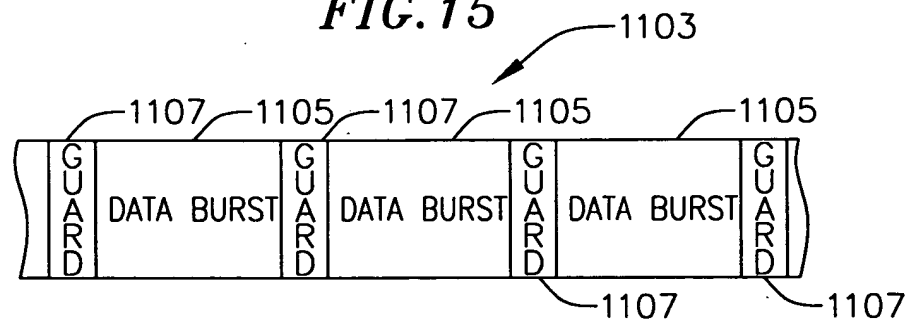


FIG. 16

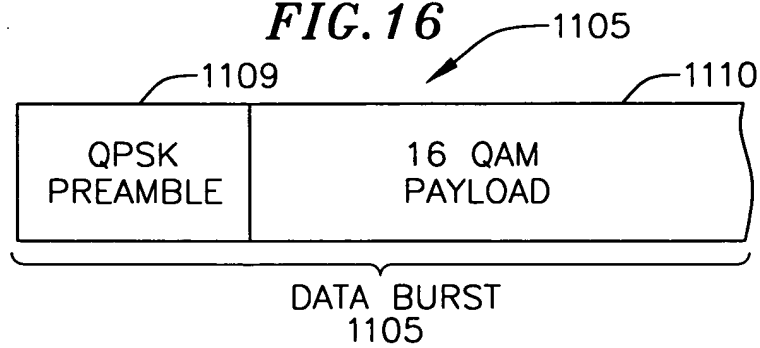


FIG. 17

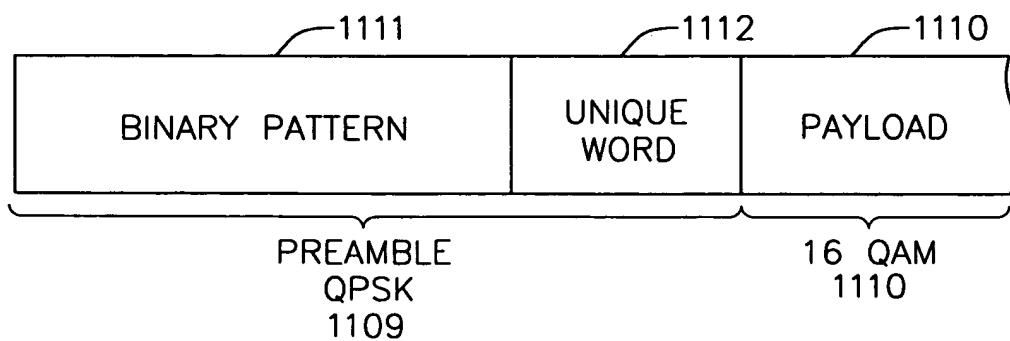


FIG. 18

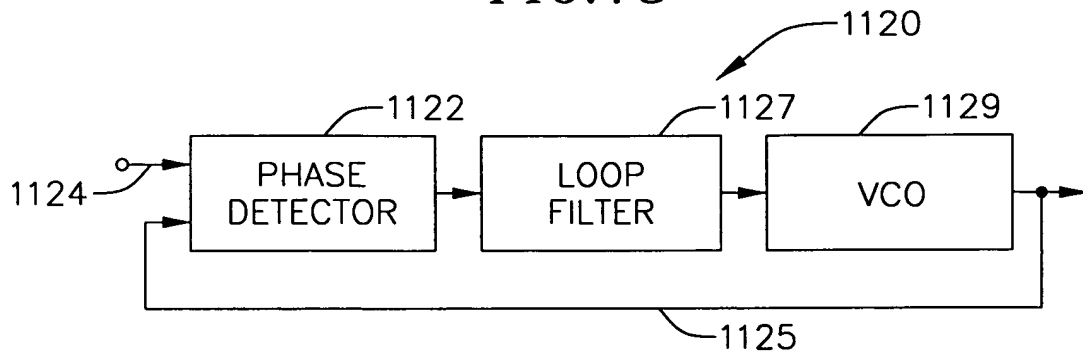


FIG. 19

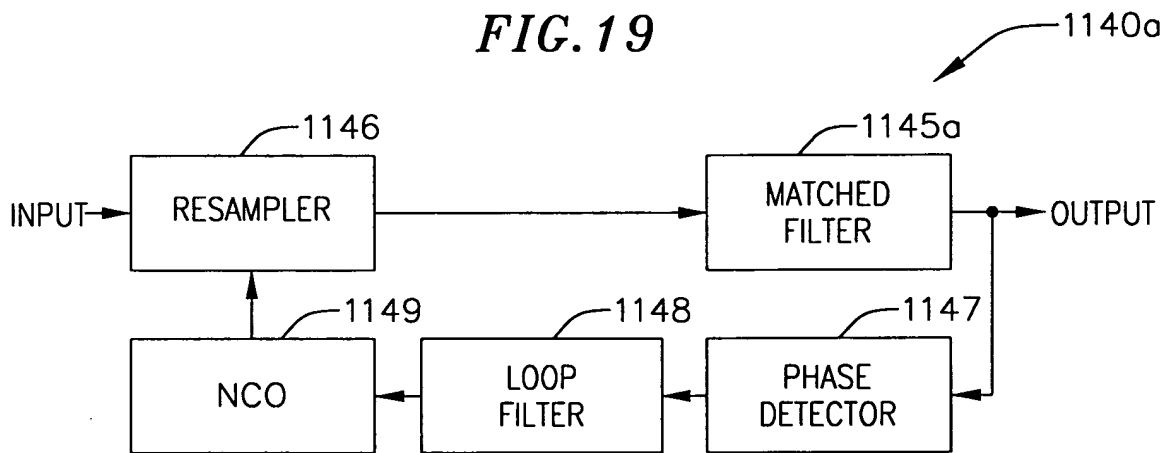


FIG. 20

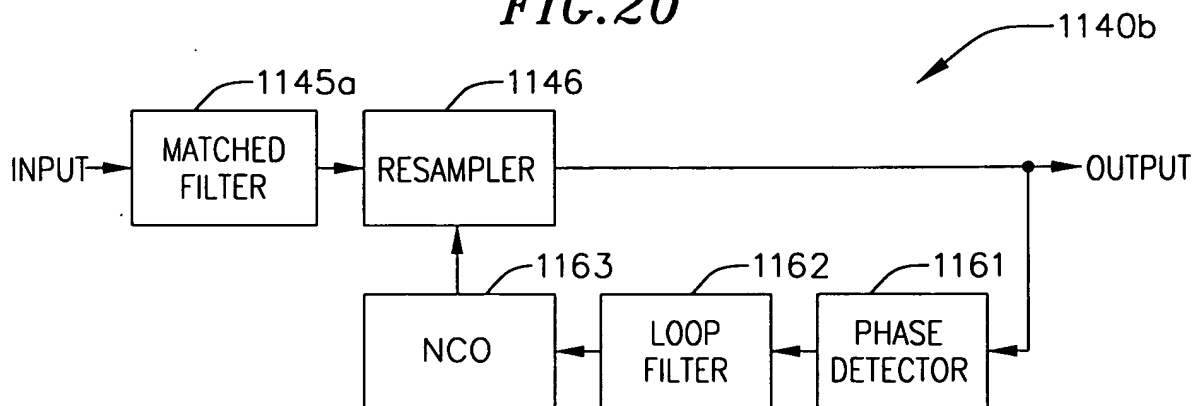


FIG. 21

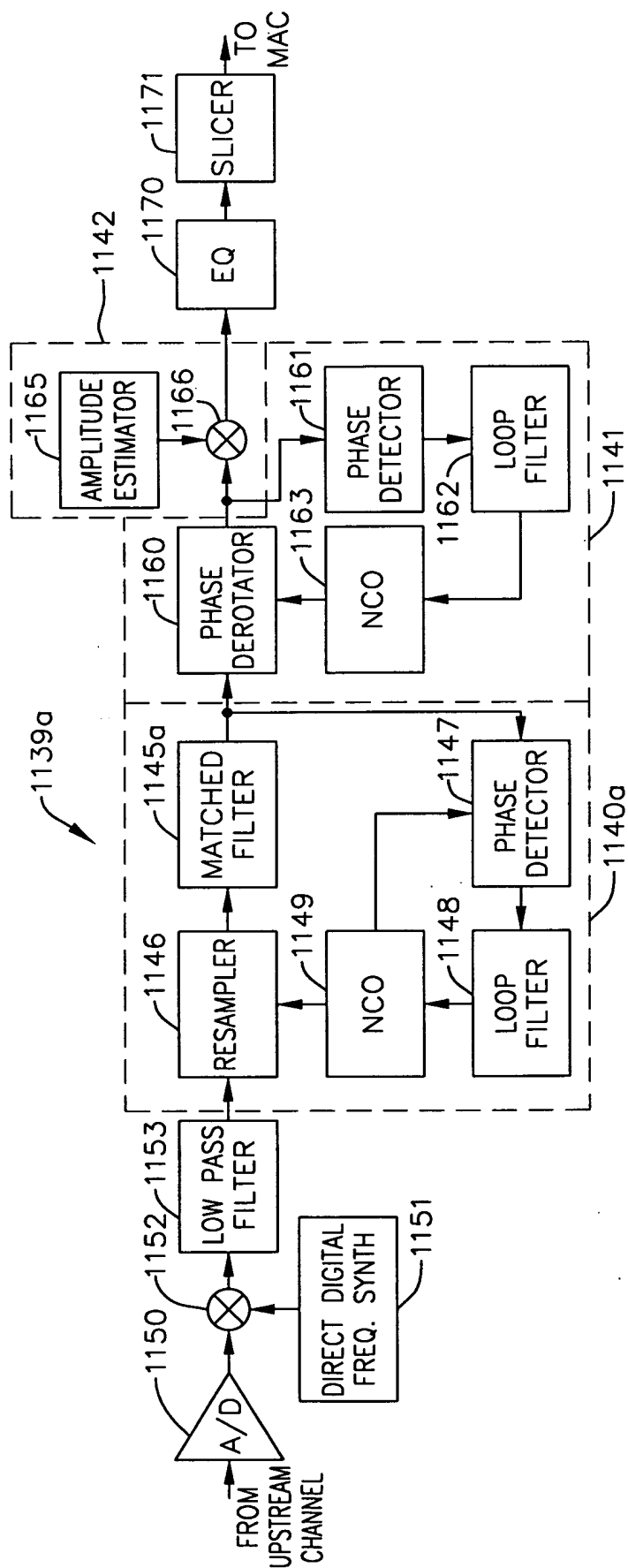


FIG. 22

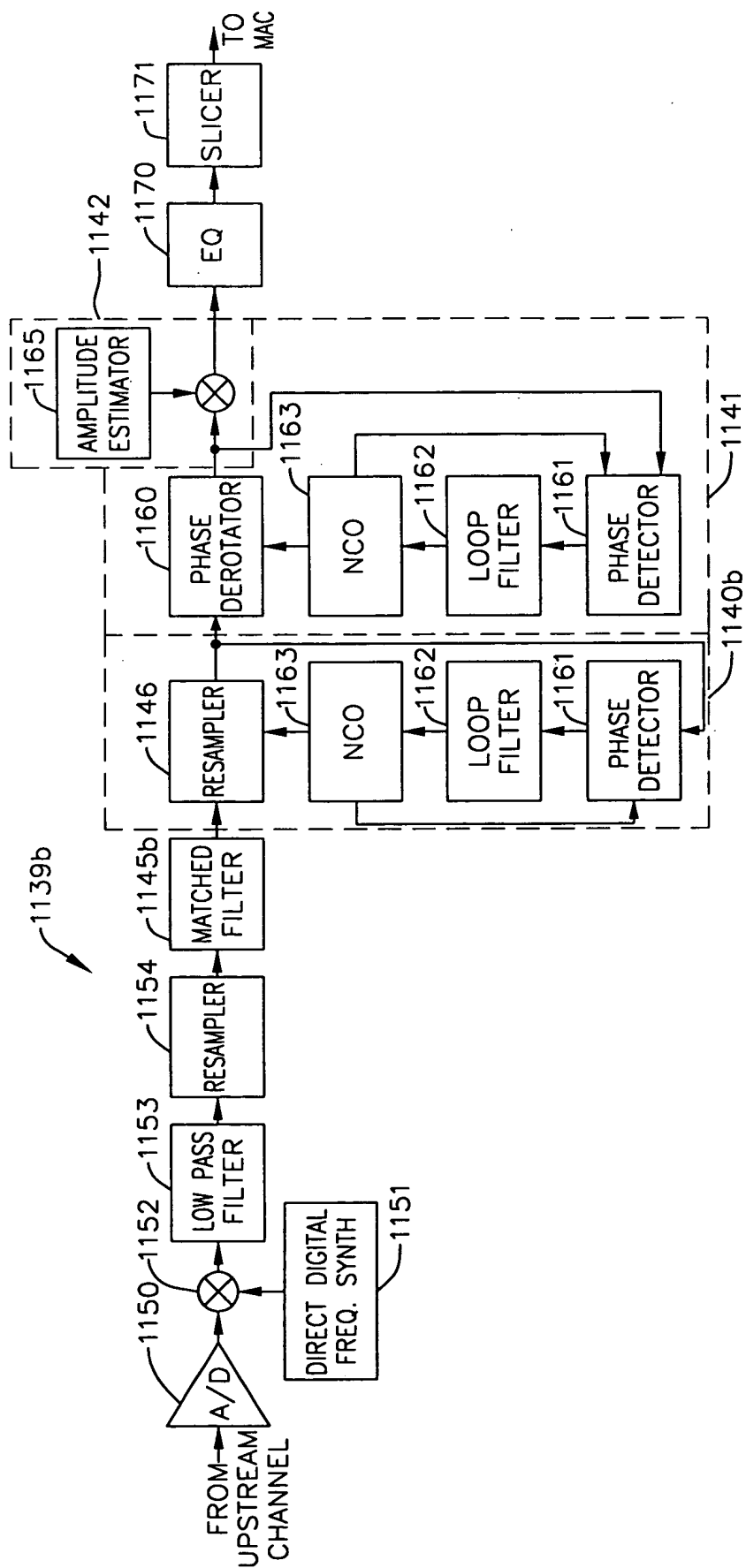


FIG.23

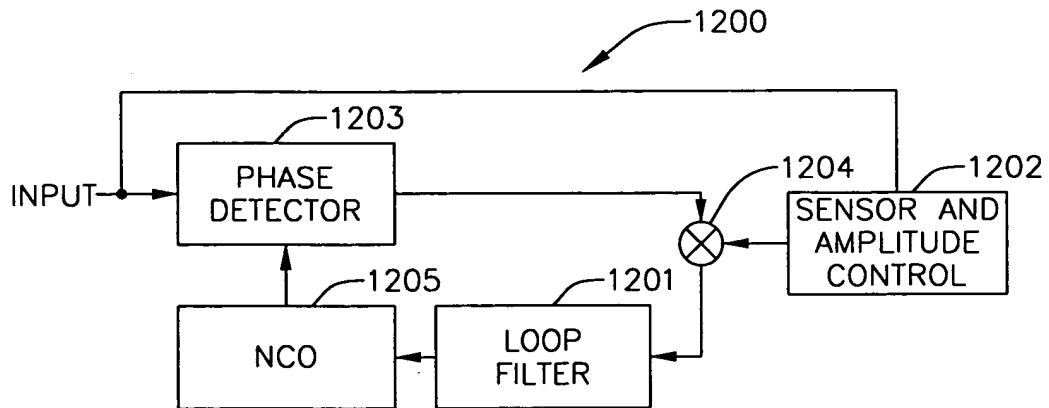
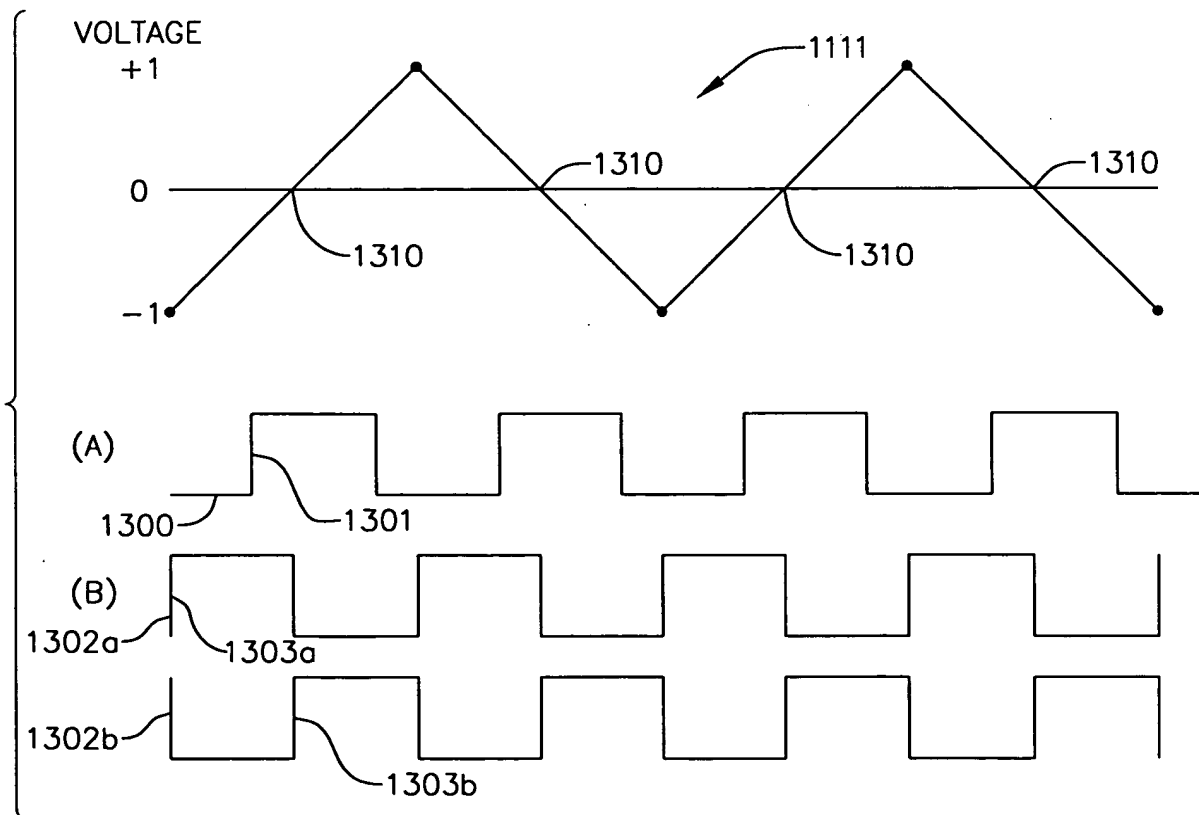


FIG.24



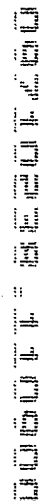
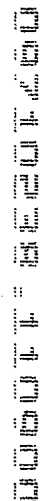
[illegible][illegible]

FIG.26

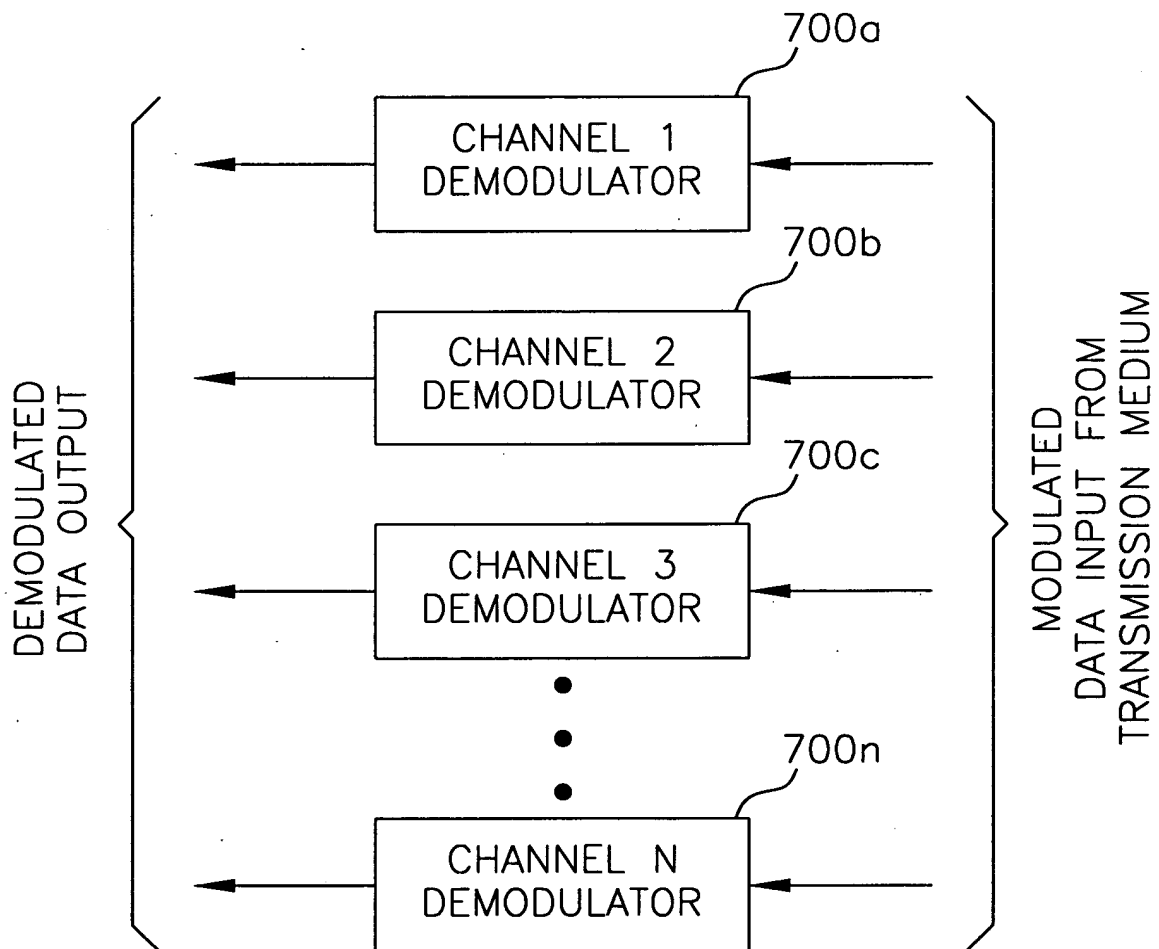


FIG. 27

CABLE MODEM
TERMINATION SYSTEM

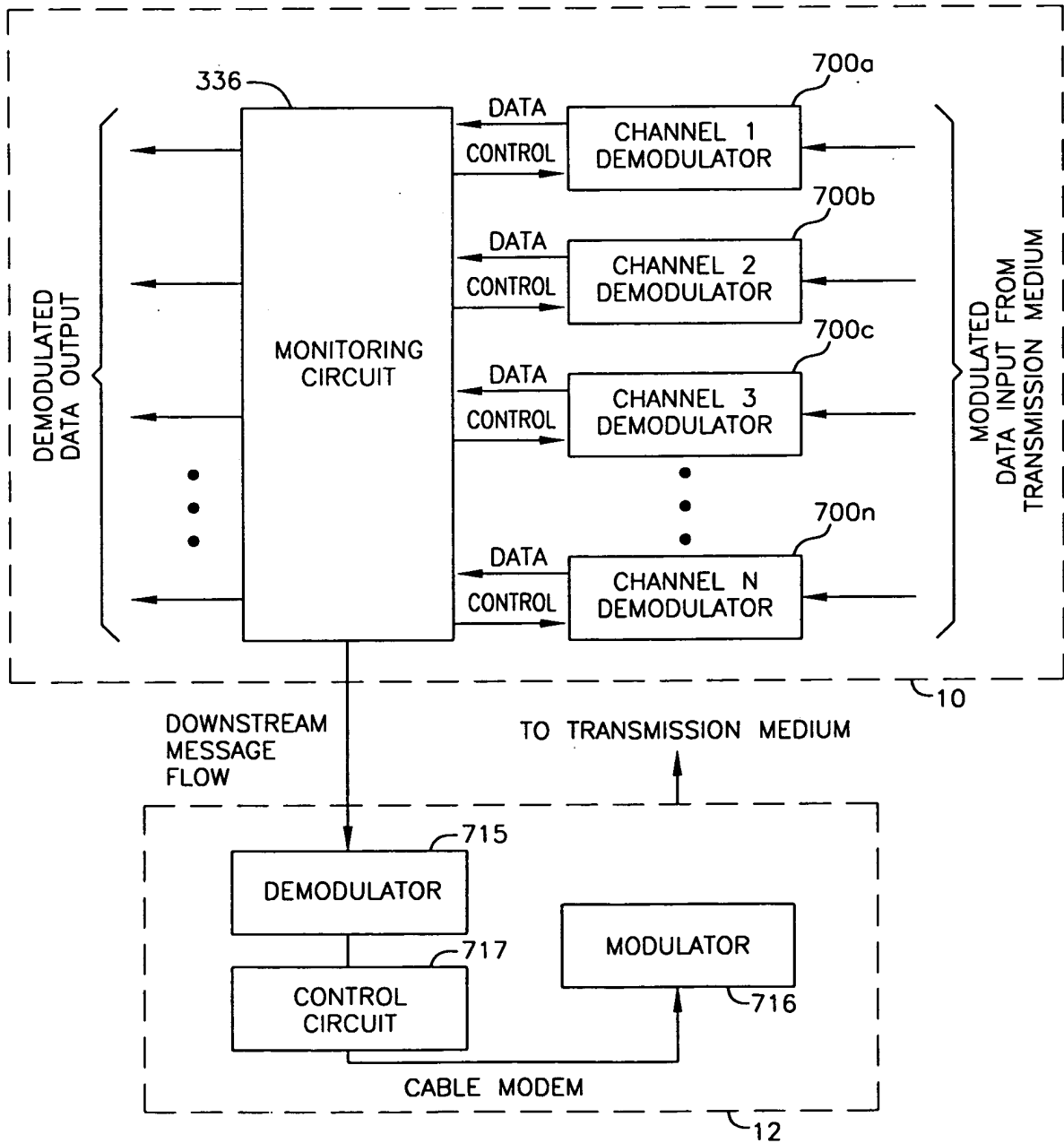


FIG. 29

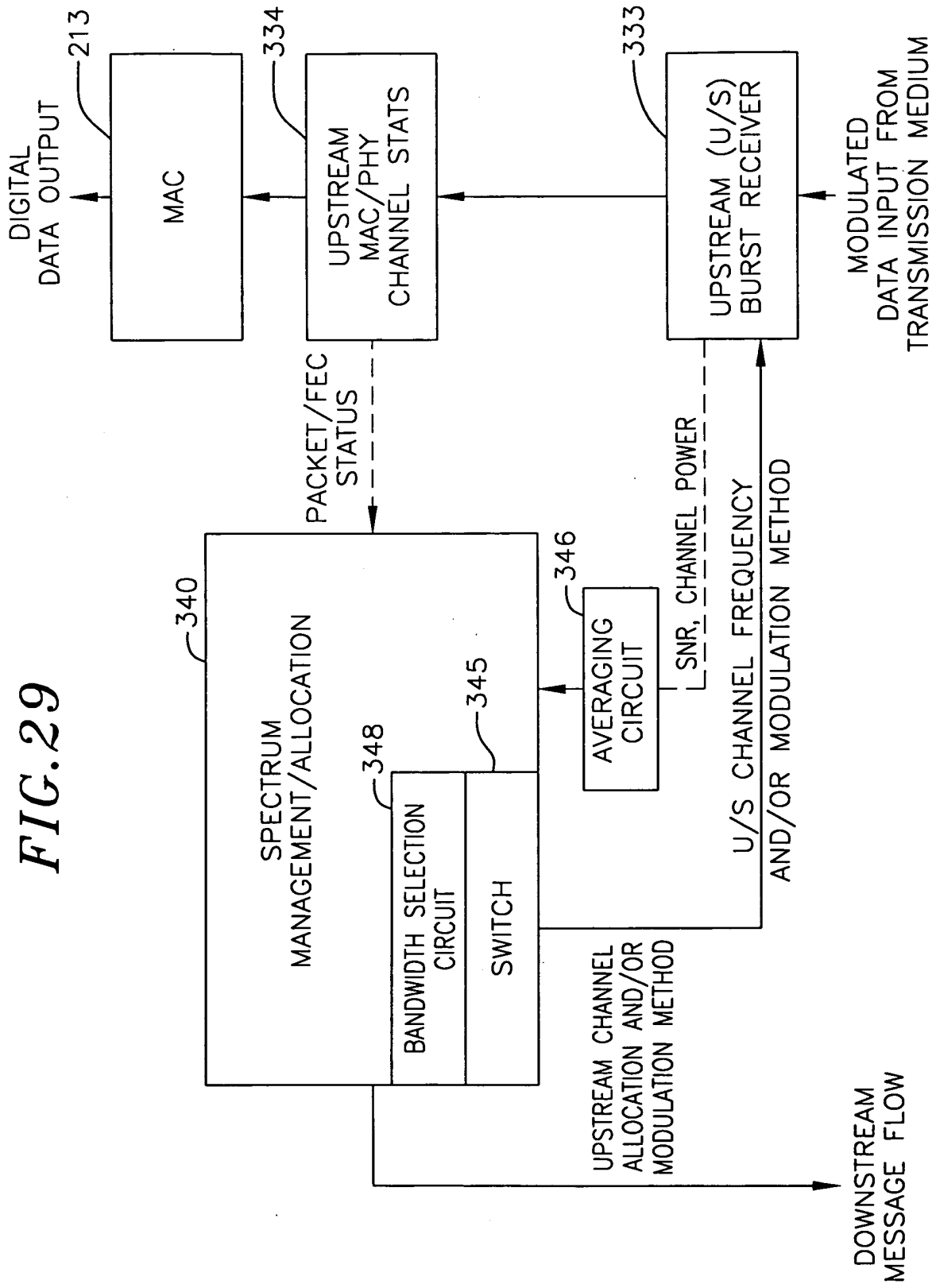


FIG.30

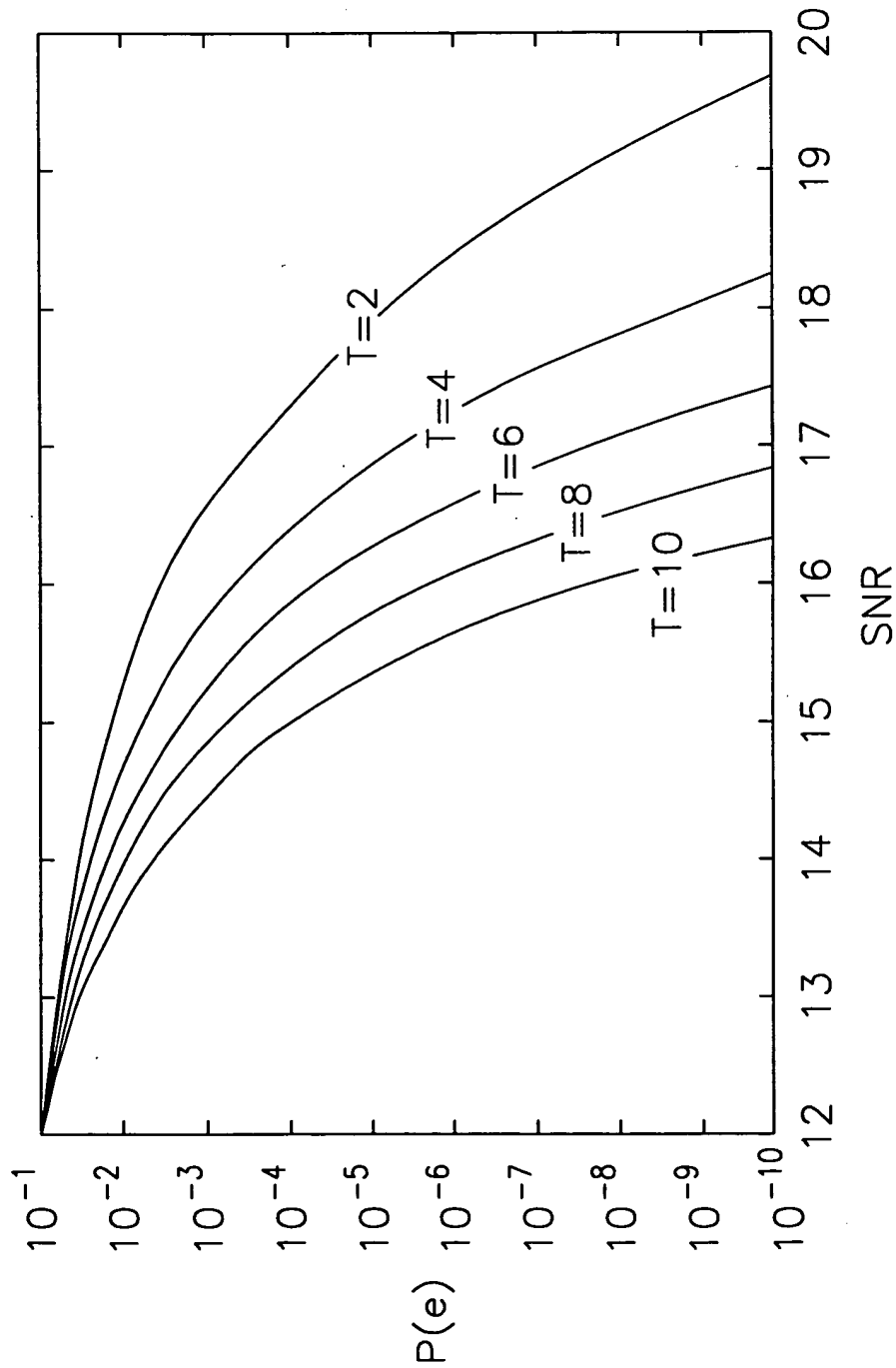


FIG. 31

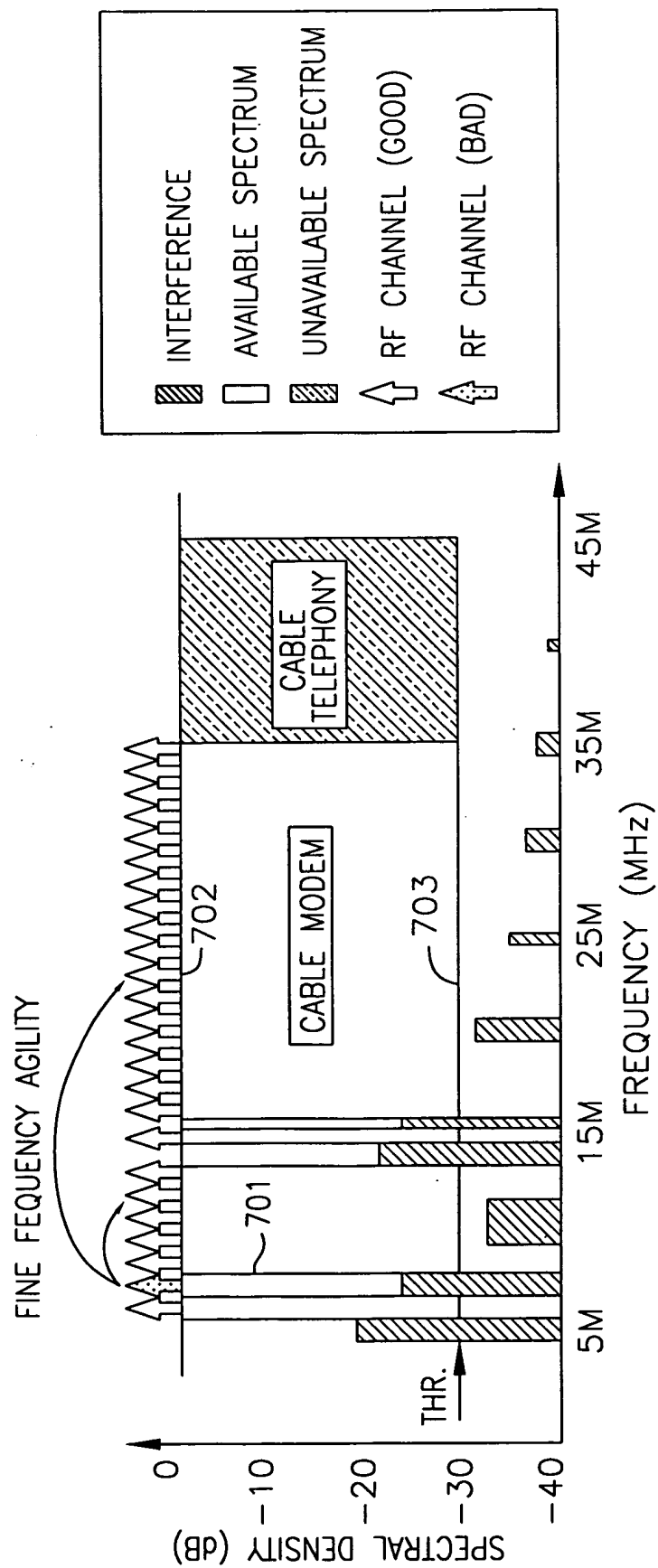


FIG. 32

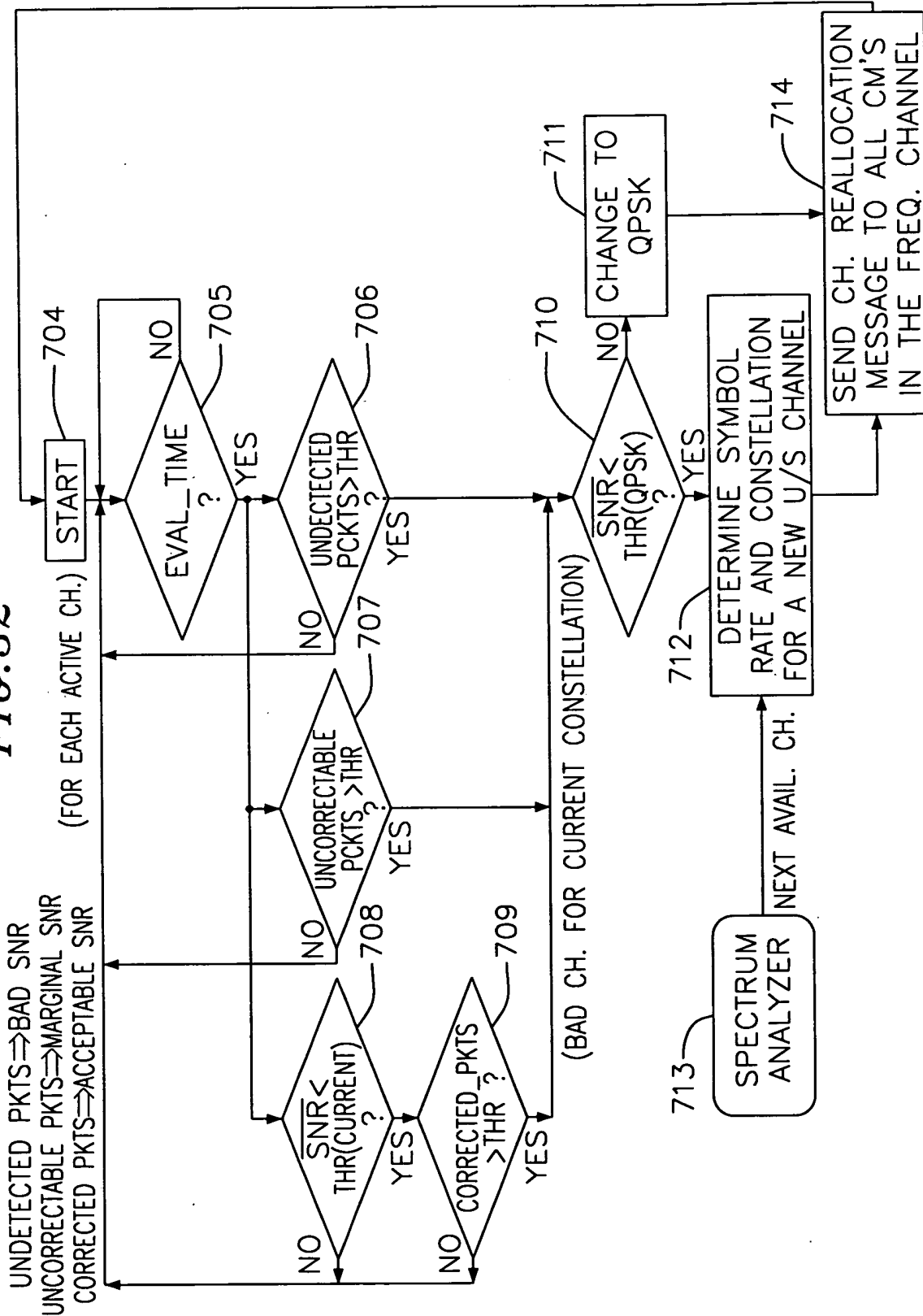


FIG. 33

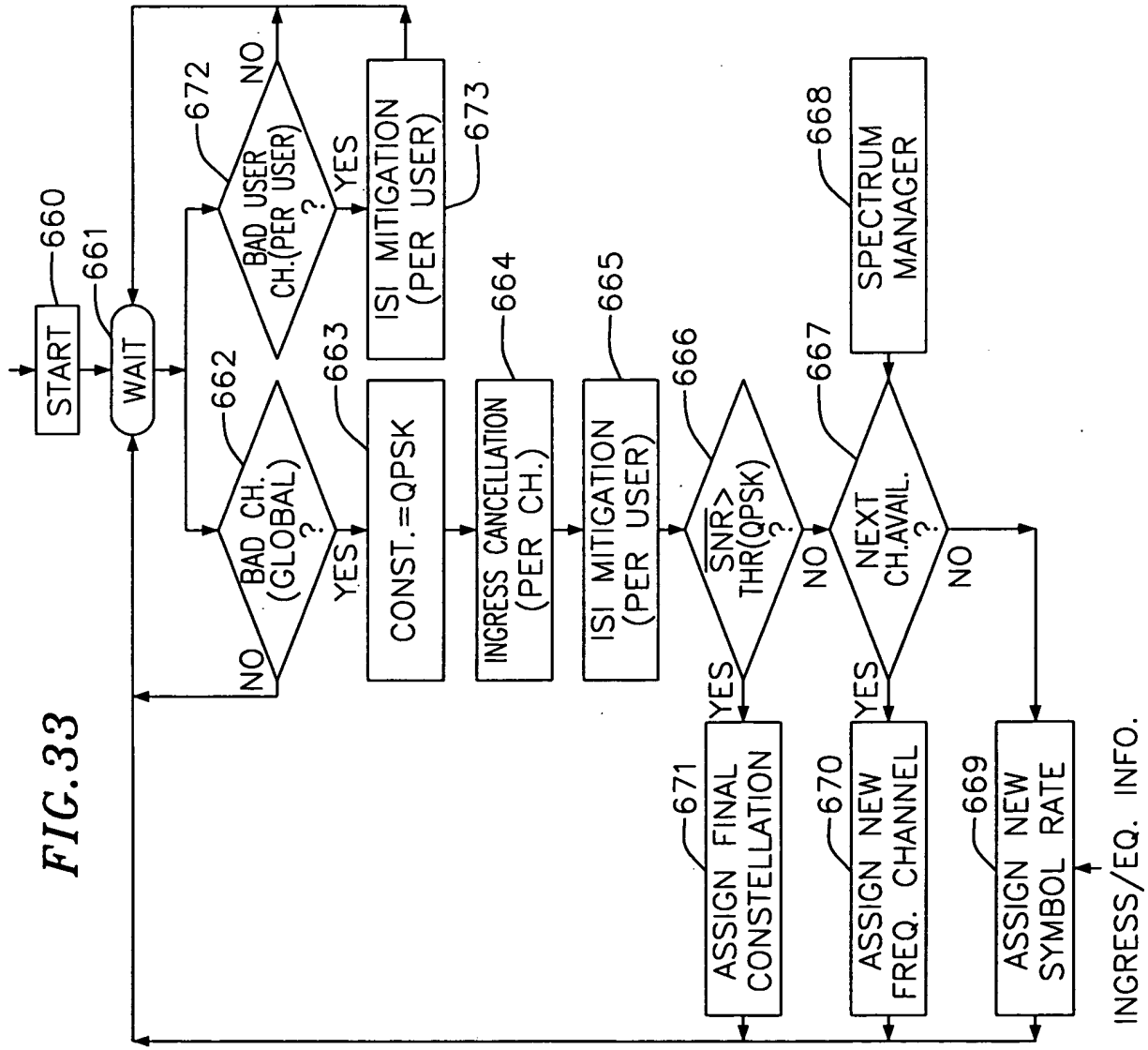


FIG. 34

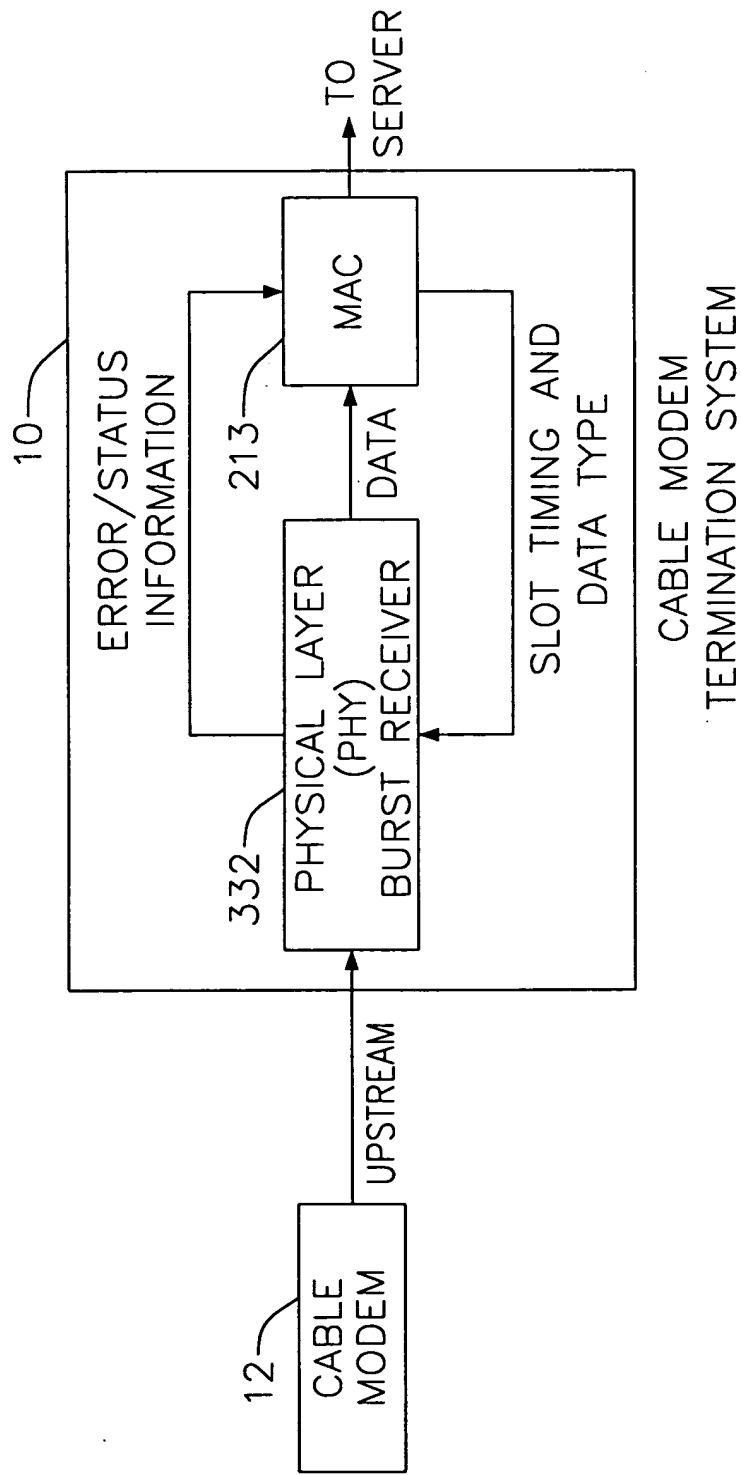
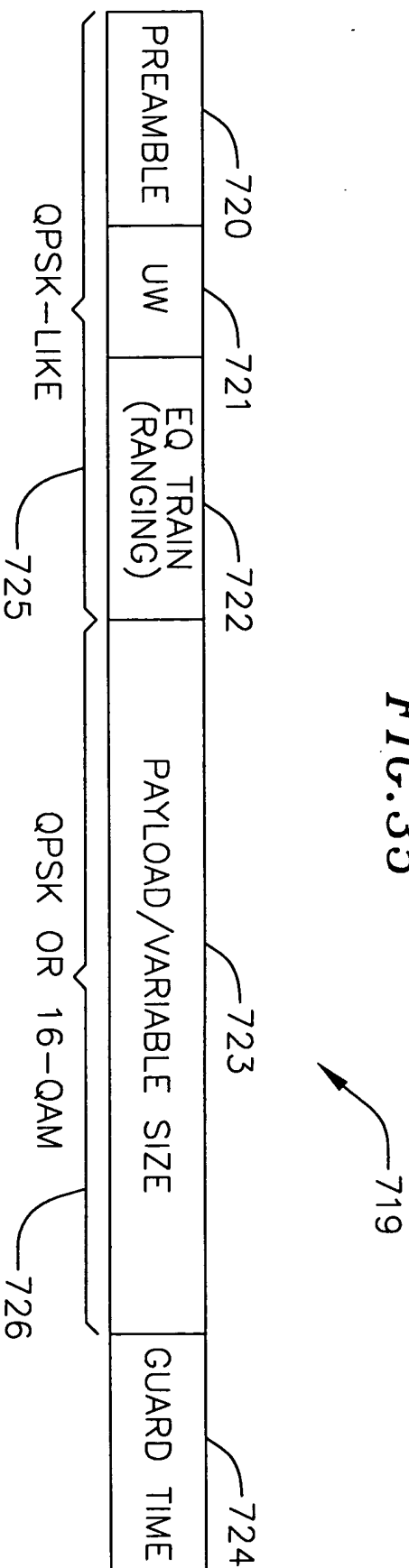


FIG. 35



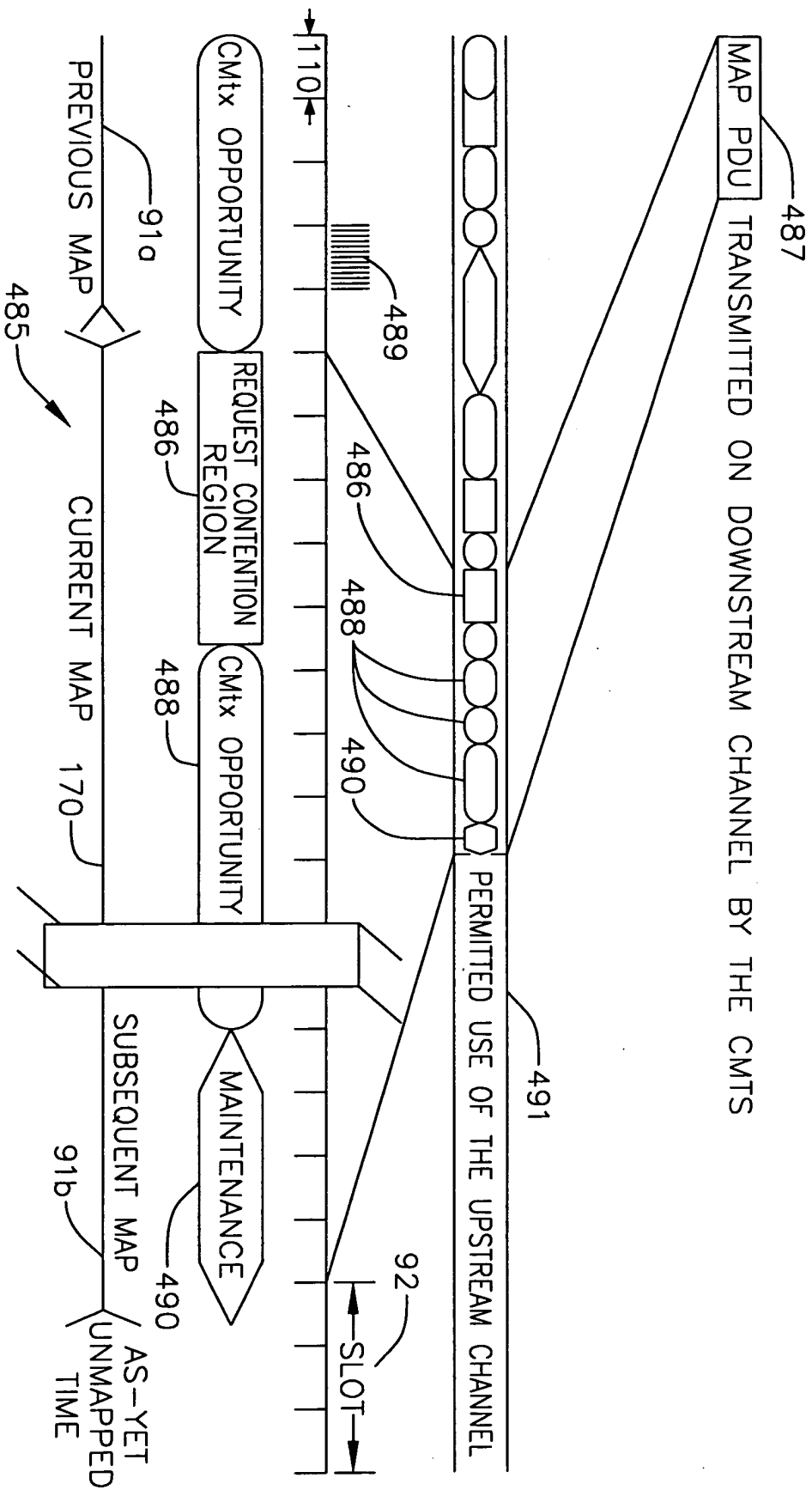


FIG. 37

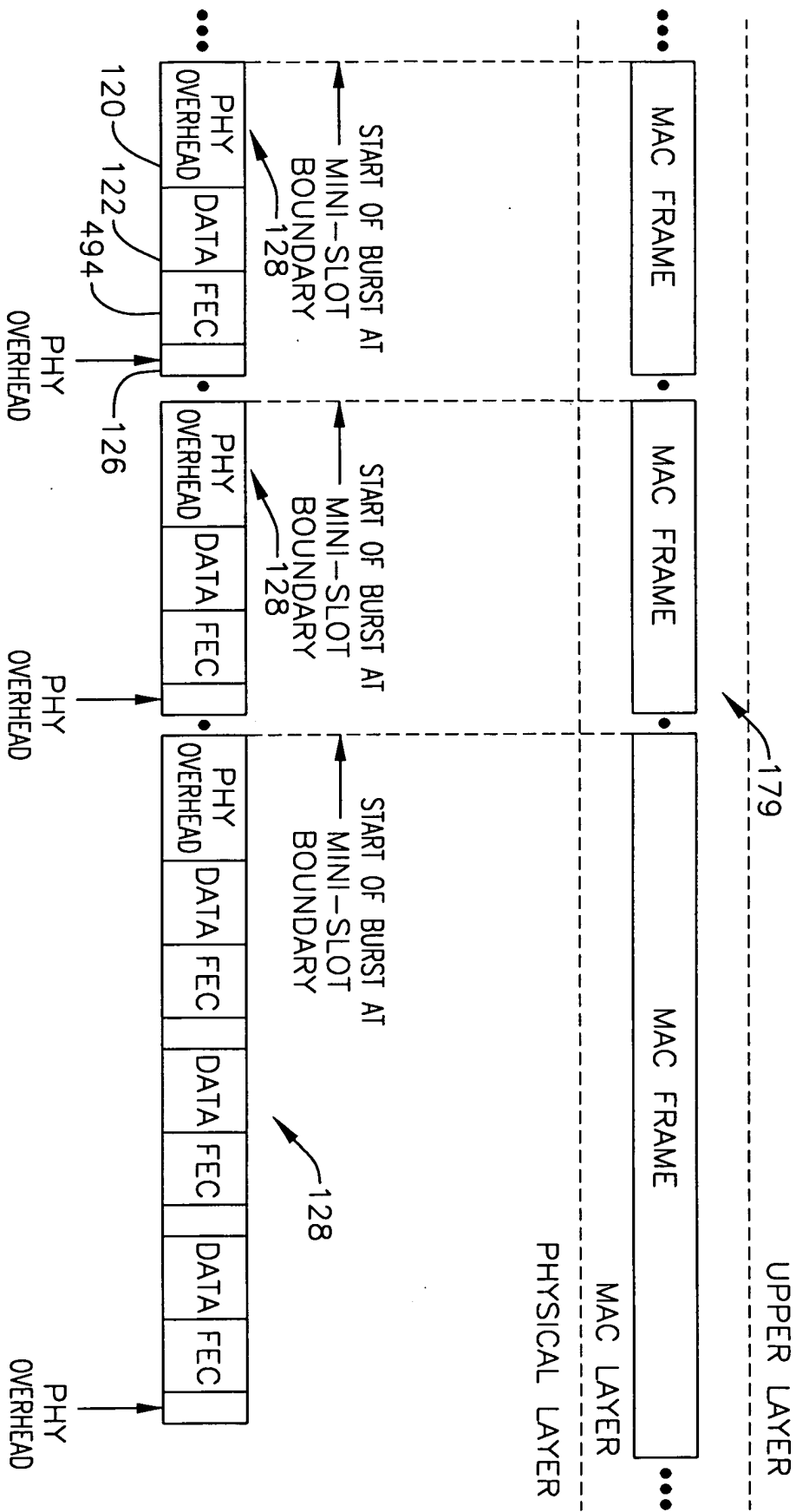


FIG. 38

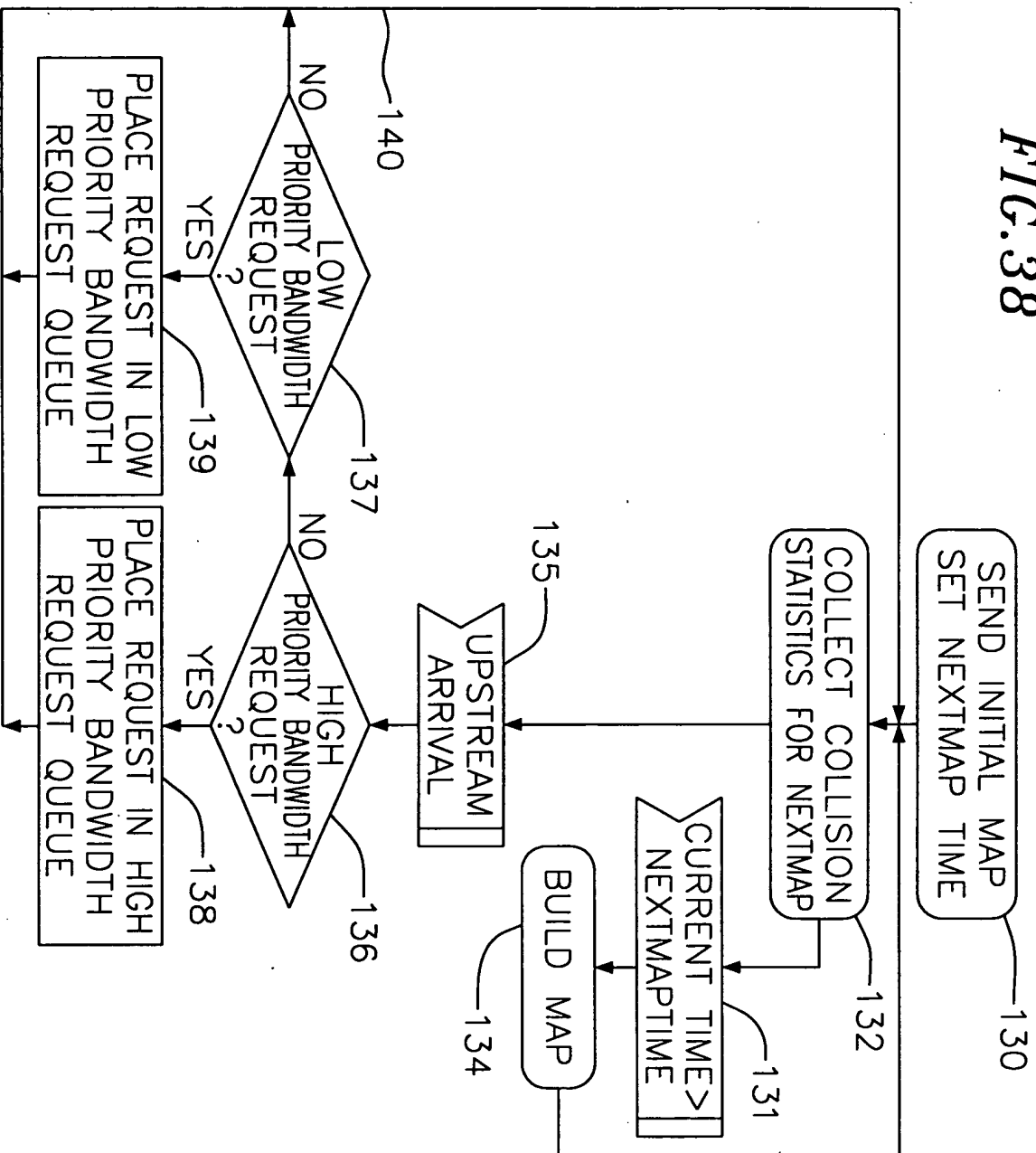


FIG. 39

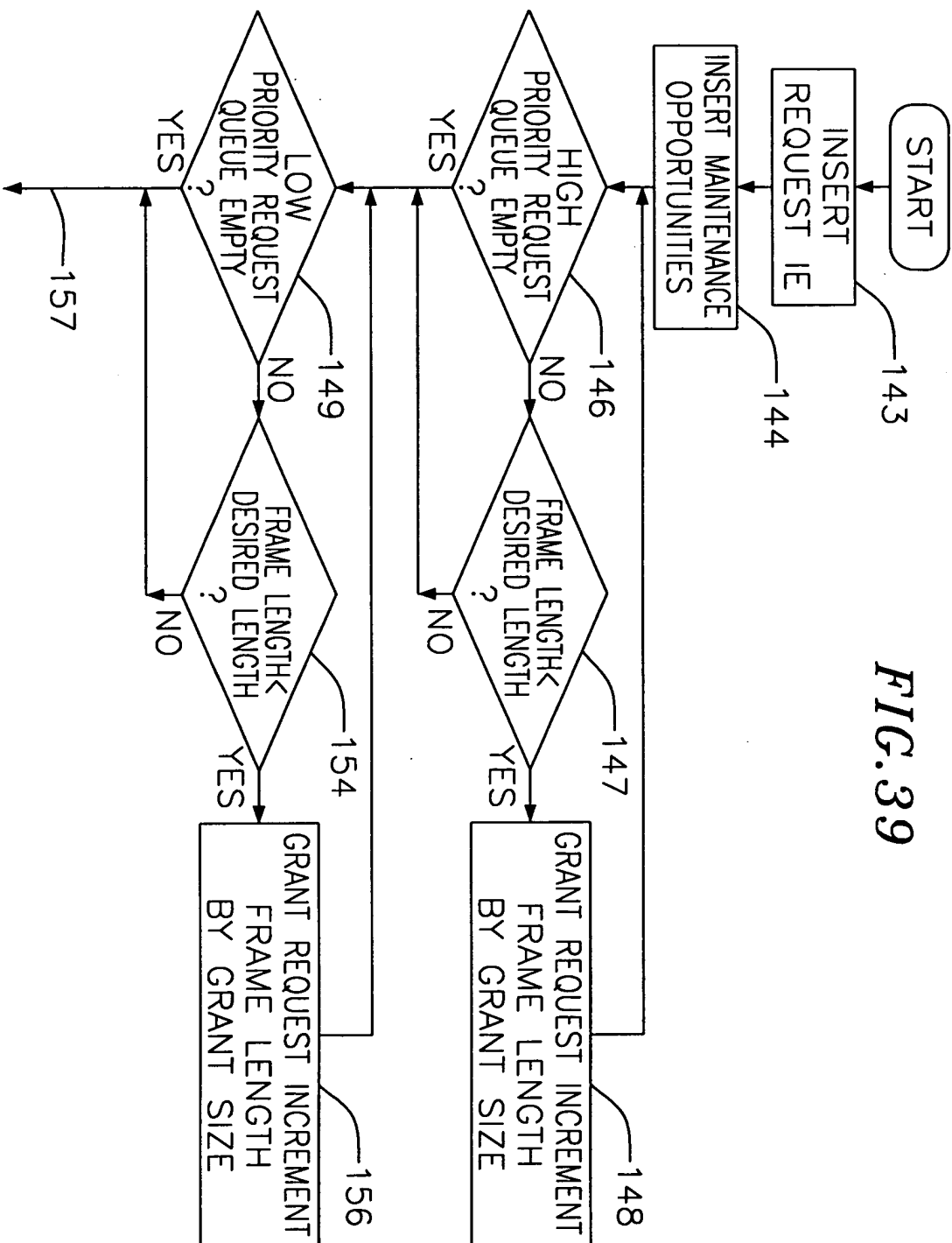


FIG. 40

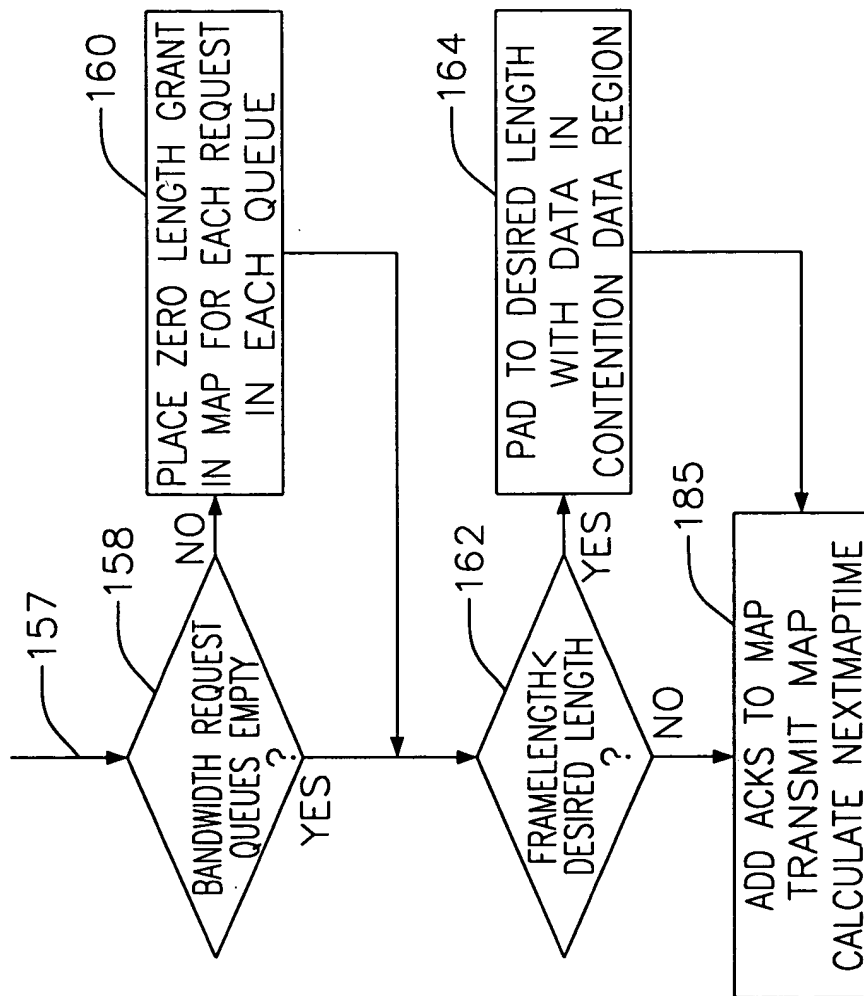


FIG. 41

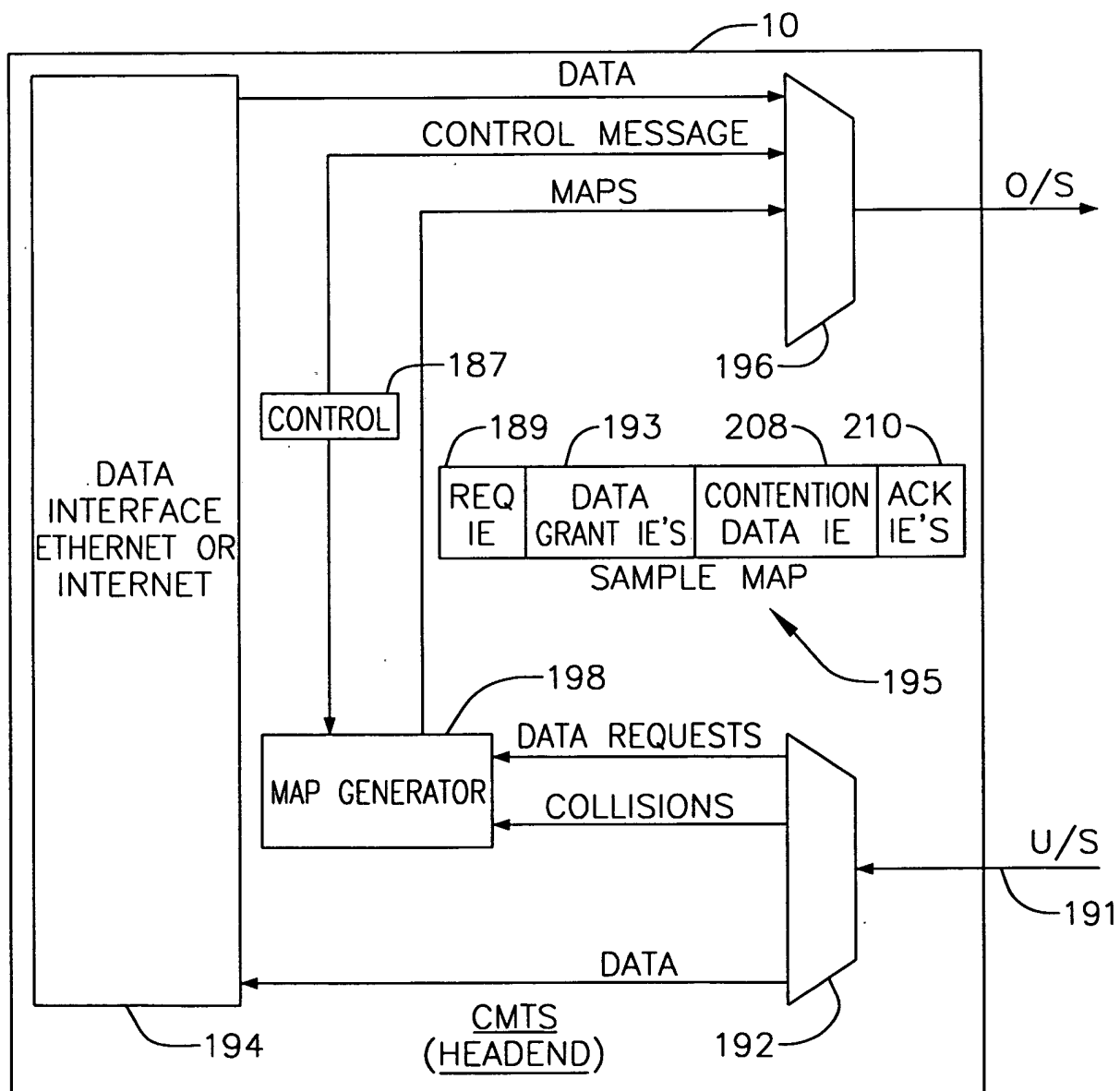


FIG. 42

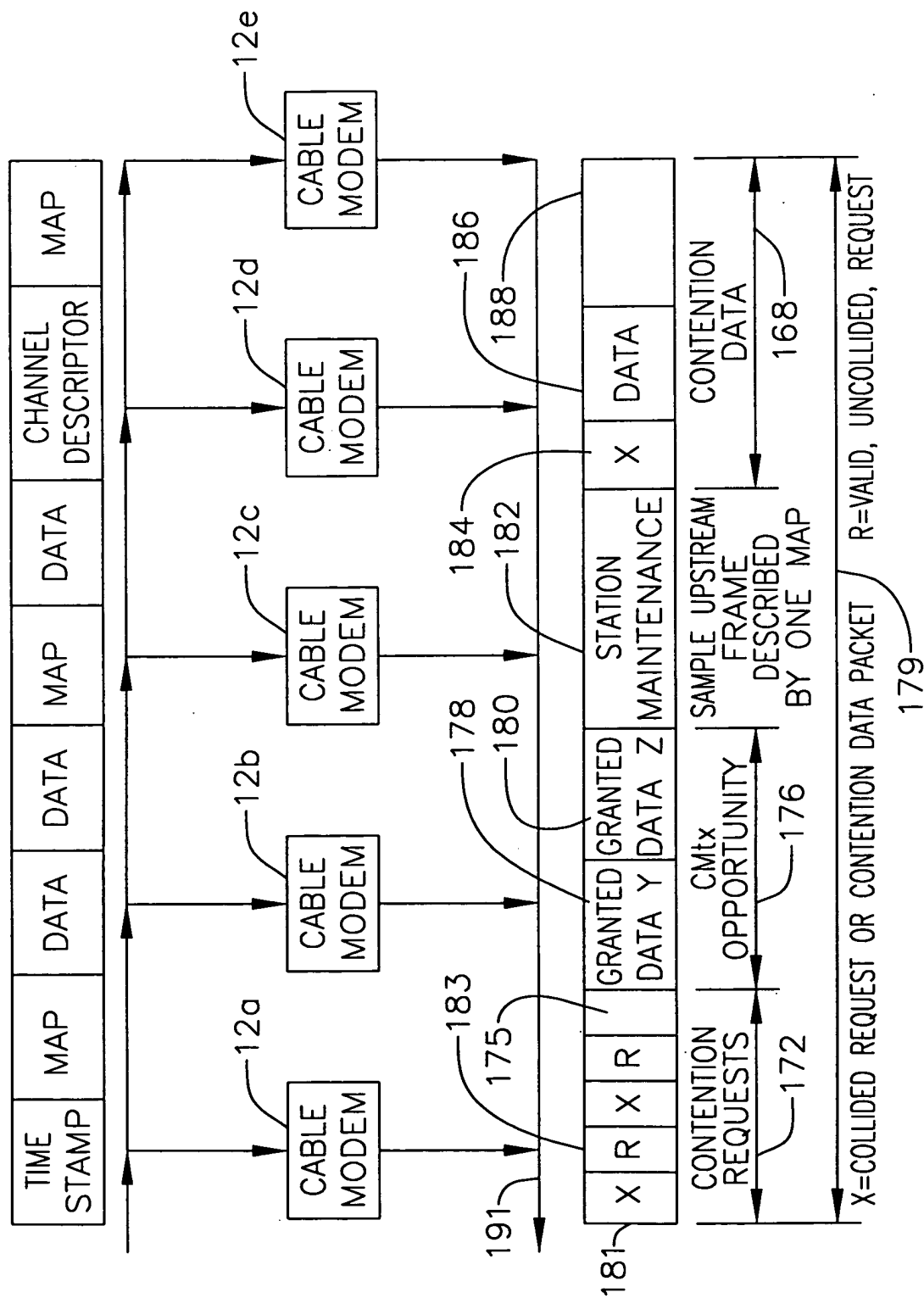


FIG. 43

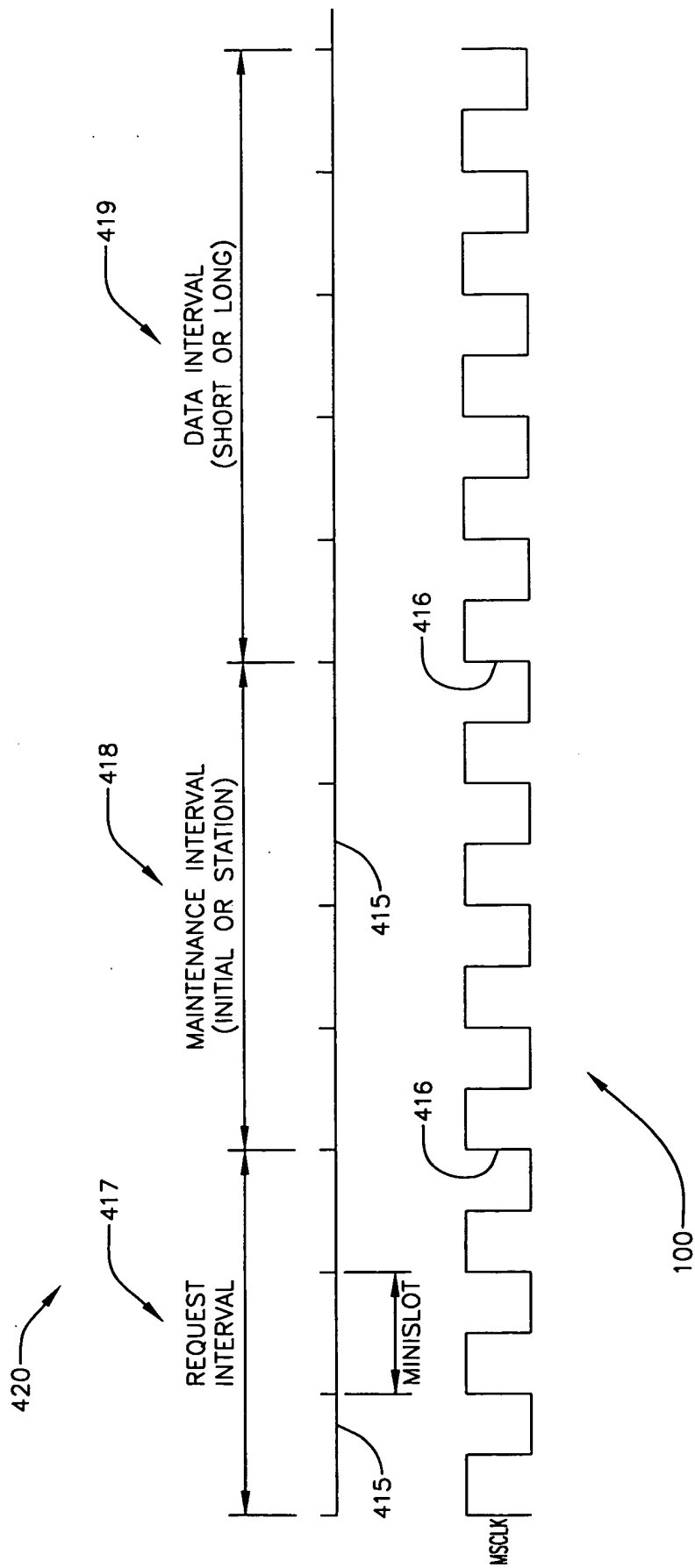


FIG. 45

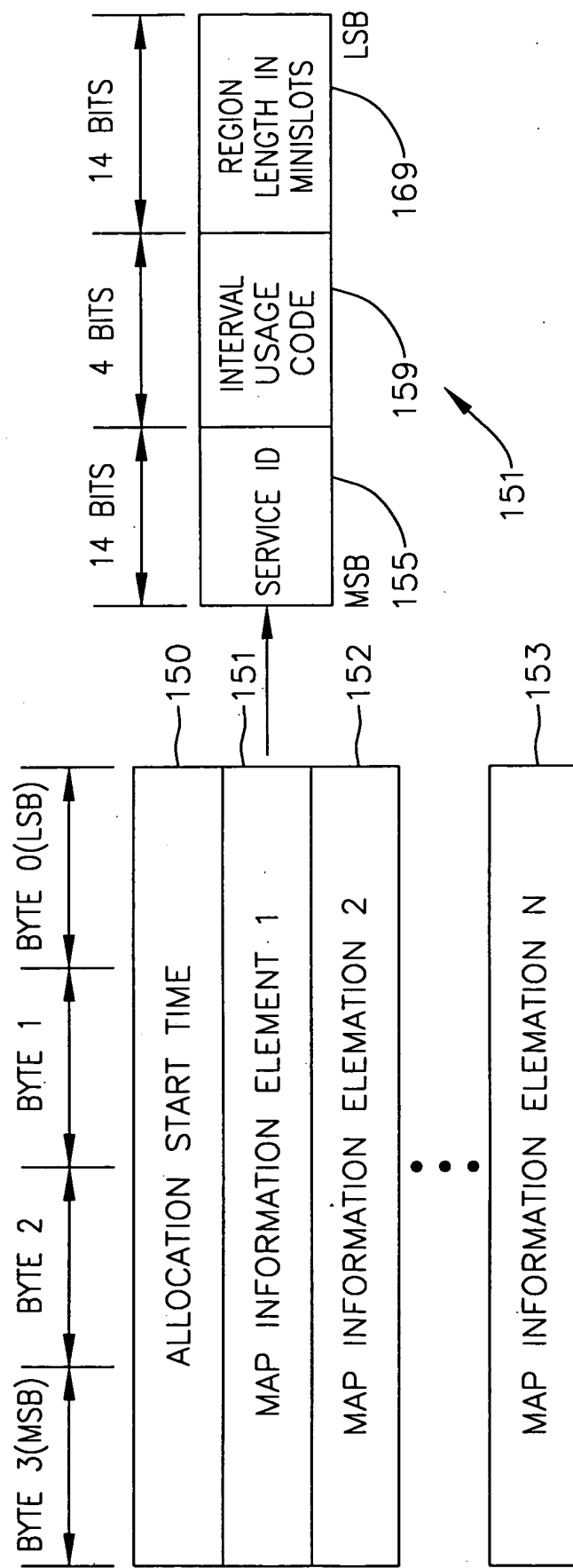


FIG. 46

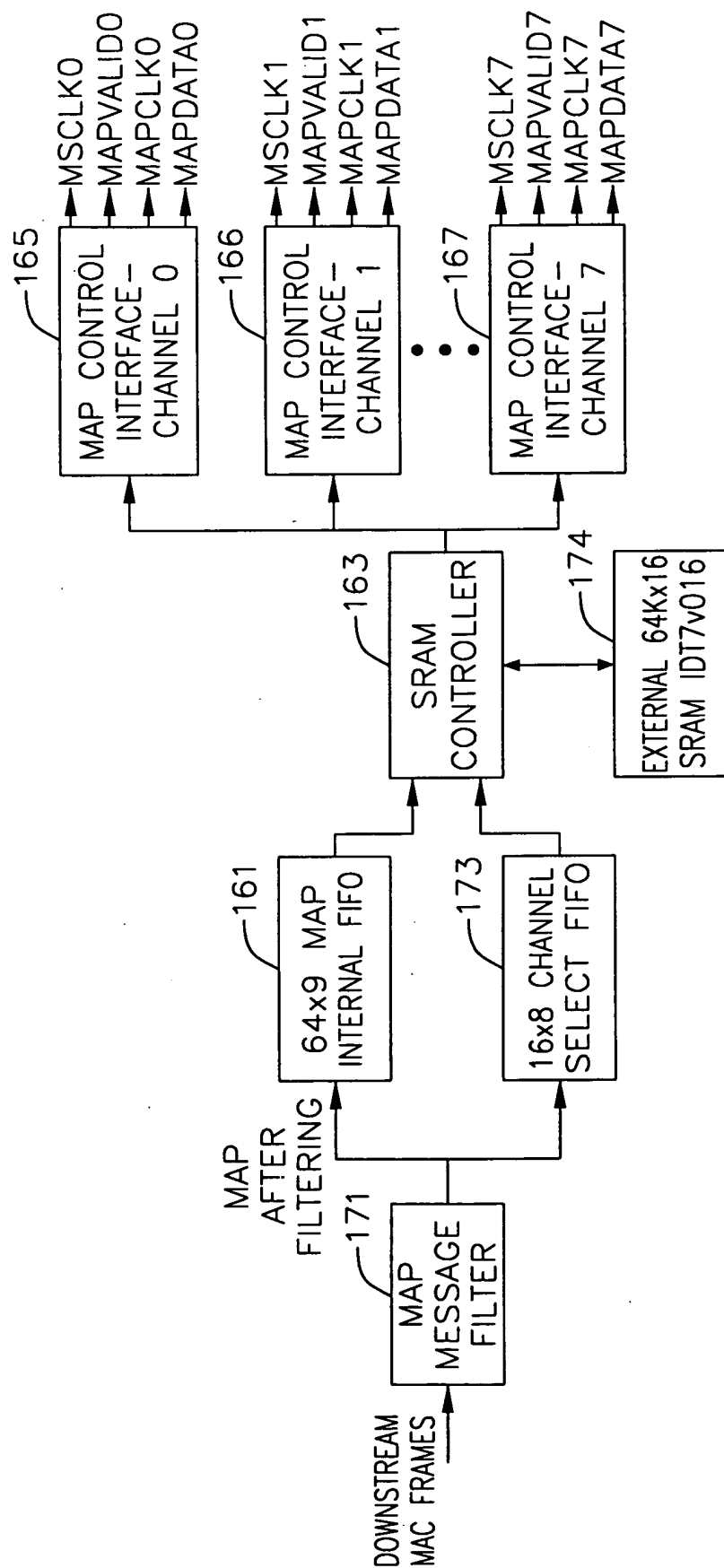


FIG. 47

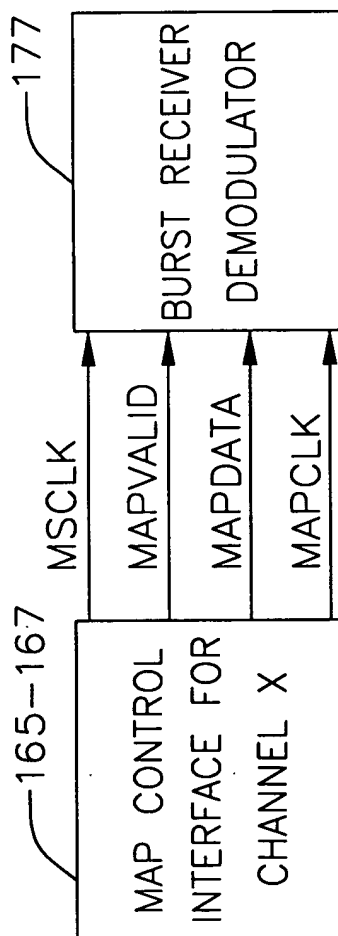


FIG. 48

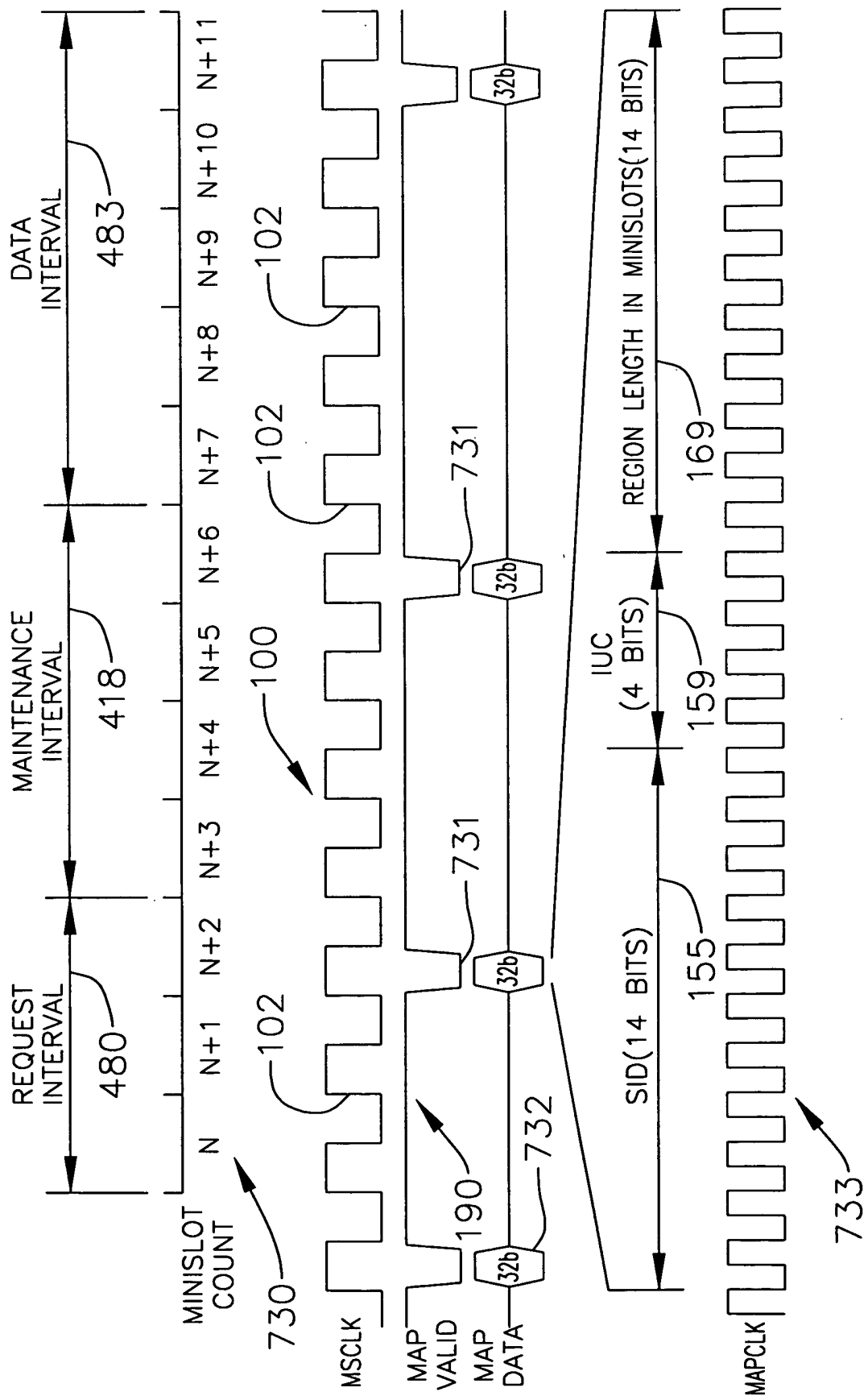


FIG. 49

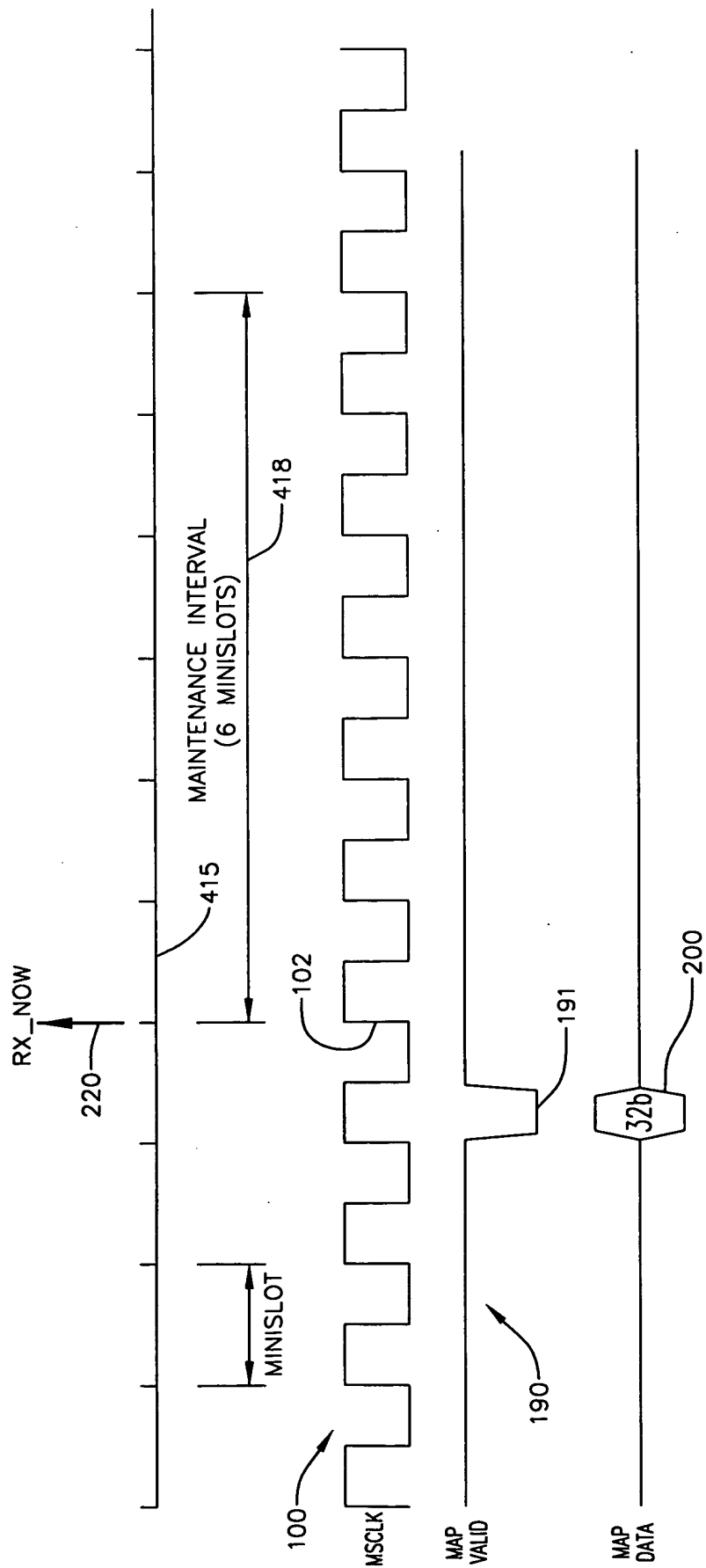


FIG.50

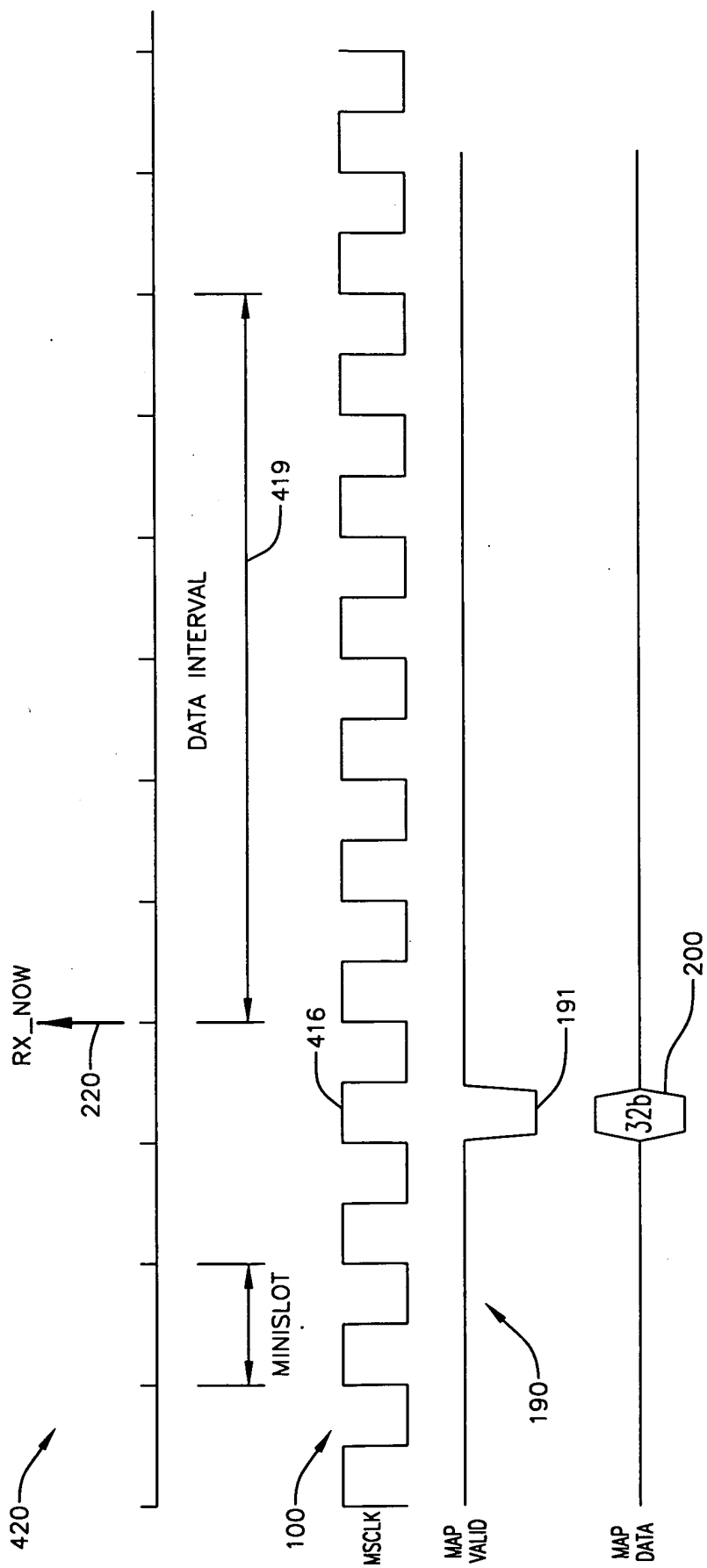


FIG. 51

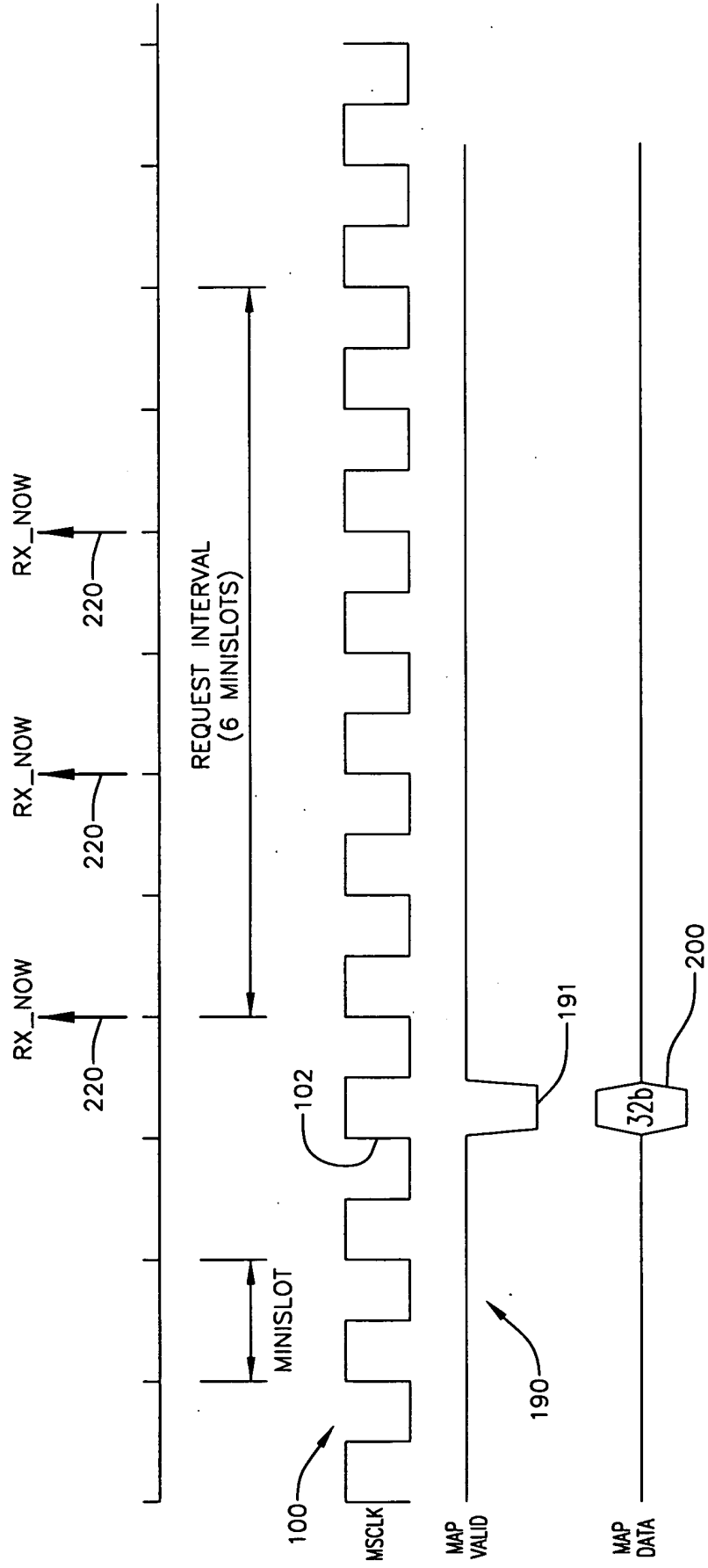


FIG.52

RNG. OFFSET 7 BYTES

STATUS	TIMESTAMP	CH. ID	SID	PWR.	FREQ.	TIME
2 BYTES	4 BYTES	1 BYTE	2 BYTES	2 BYTES	2 BYTES	3 BYTES

FIG.53

RNG. OFFSET 7 BYTES

STATUS	TIMESTAMP	CH. ID	SID	PWR.	FREQ.	TIME	EQUALIZER COEFFS.
2 BYTES	4 BYTES	1 BYTE	2 BYTES	2 BYTES	2 BYTES	3 BYTES	32 BYTES

FIG.54

BASED ON THE STATUS BYTES[7:5] BITS, THE FOLLOWING STATISTICS ARE KEPT USING COUNTERS.

SLOT DEFINITION	STATISTICS	CALCULATION
DATA	1.NUMBER OF SLOTS 2.NUMBER OF SLOTS WITH POWER BUT NO DATA 3.NUMBER OF SLOTS WITH BAD DATA 4.NUMBER OF GOOD DATA-SLOTS 5.TOTAL NUMBER OF FEC BLOCKS 6.NUMBER OF FEC BLOCKS WITH CORRECTABLE ERRORS. 7.NUMBER OF UNCORRECTABLE FEC BLOCKS	NO UW UW AND (BAD FEC OR BAD HEC) UW AND GOOD HEC
REQUEST(CONTENTION)	1.NUMBER OF REQUESTS RECEIVED 2.NUMBER OF COLLIDED REQUESTS 3.NUMBER OF CORRUPTED REQUESTS	NO UW NO UW OR BAD FEC OR BAD HEC
REQUEST/DATA (CONTENTION)	1.NUMBER OF PACKETS RECEIVED 2.NUMBER OF COLLIDED PACKETS 3.NUMBER OF CORRUPTED PACKETS	NO UW NO UW OR BAD FEC OR BAD HEC
RANGING	1.NUMBER OF RANGING MESSAGES RECEIVED 2.NUMBER OF COLLIDED RANGING MESSAGES RECEIVED 3.NUMBER OF CORRUPTED RANGING MESSAGES	NO UW NO UW OR BAD FEC OR BAD HEC

FIG.55

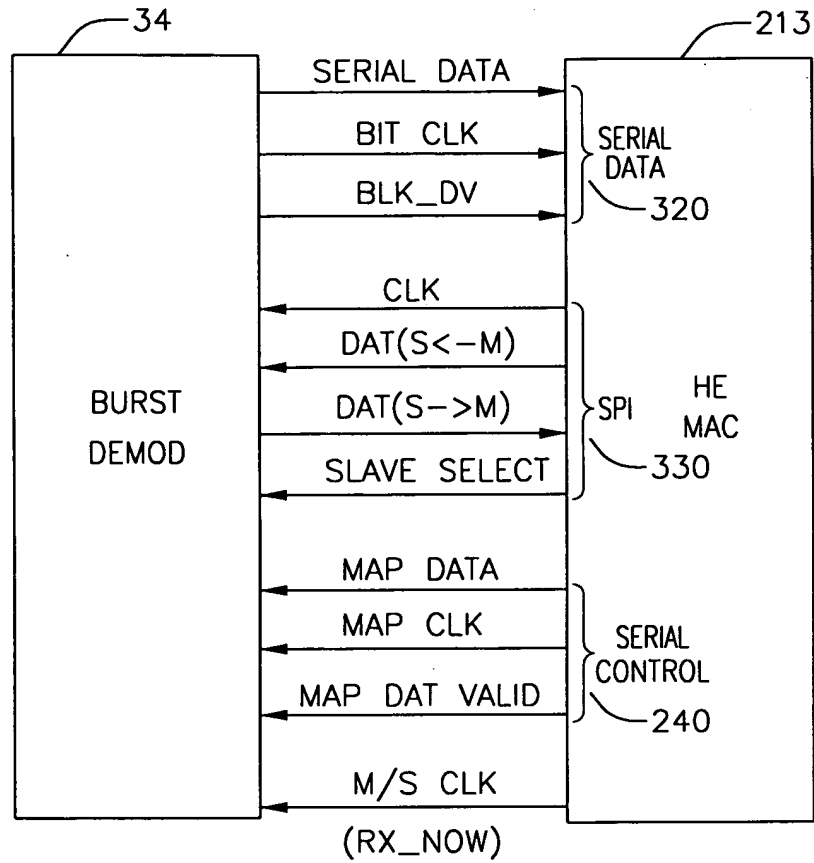


FIG.56

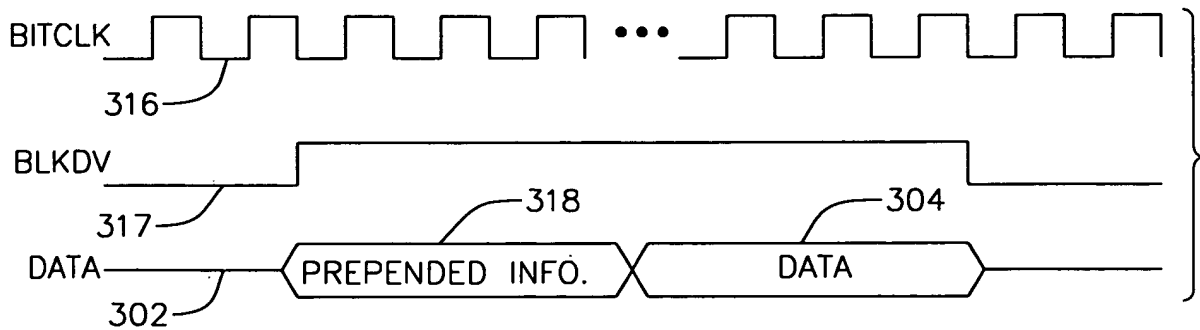


FIG. 57

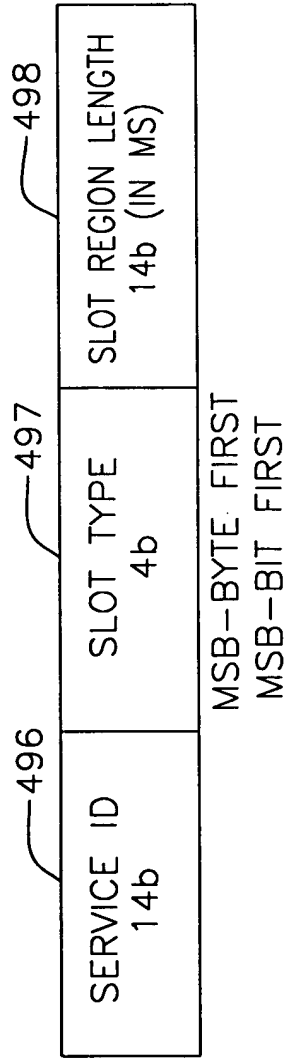


FIG. 58

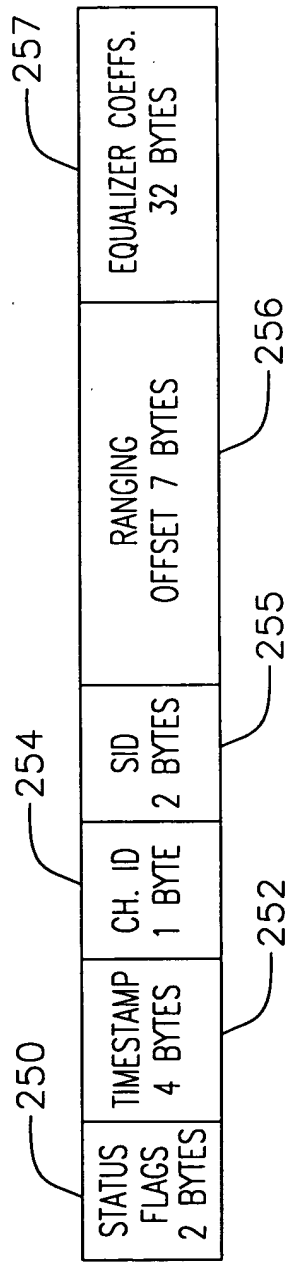


FIG. 59

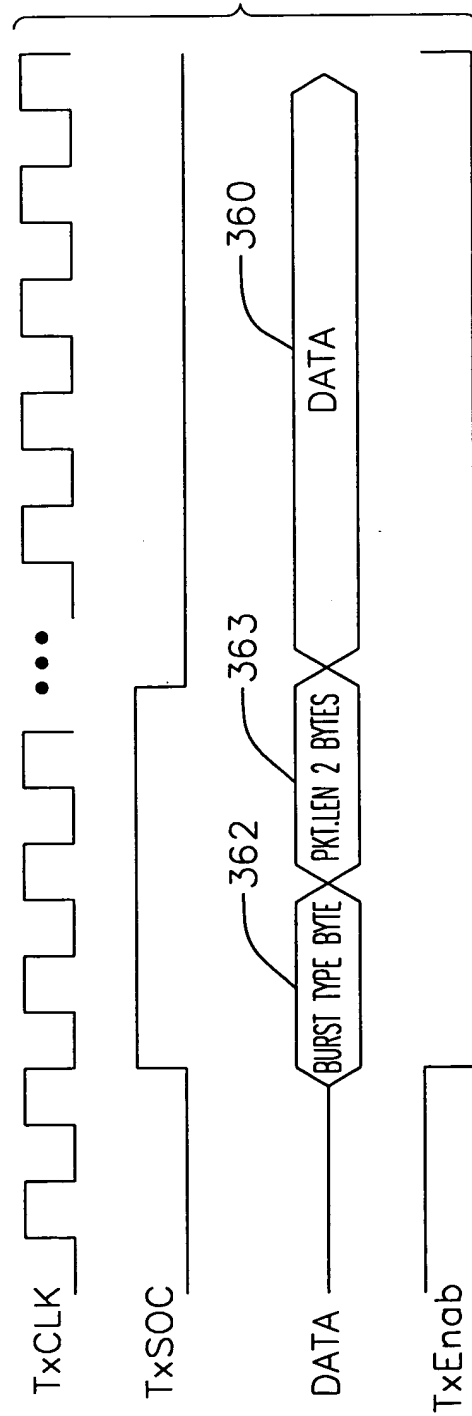


FIG. 60

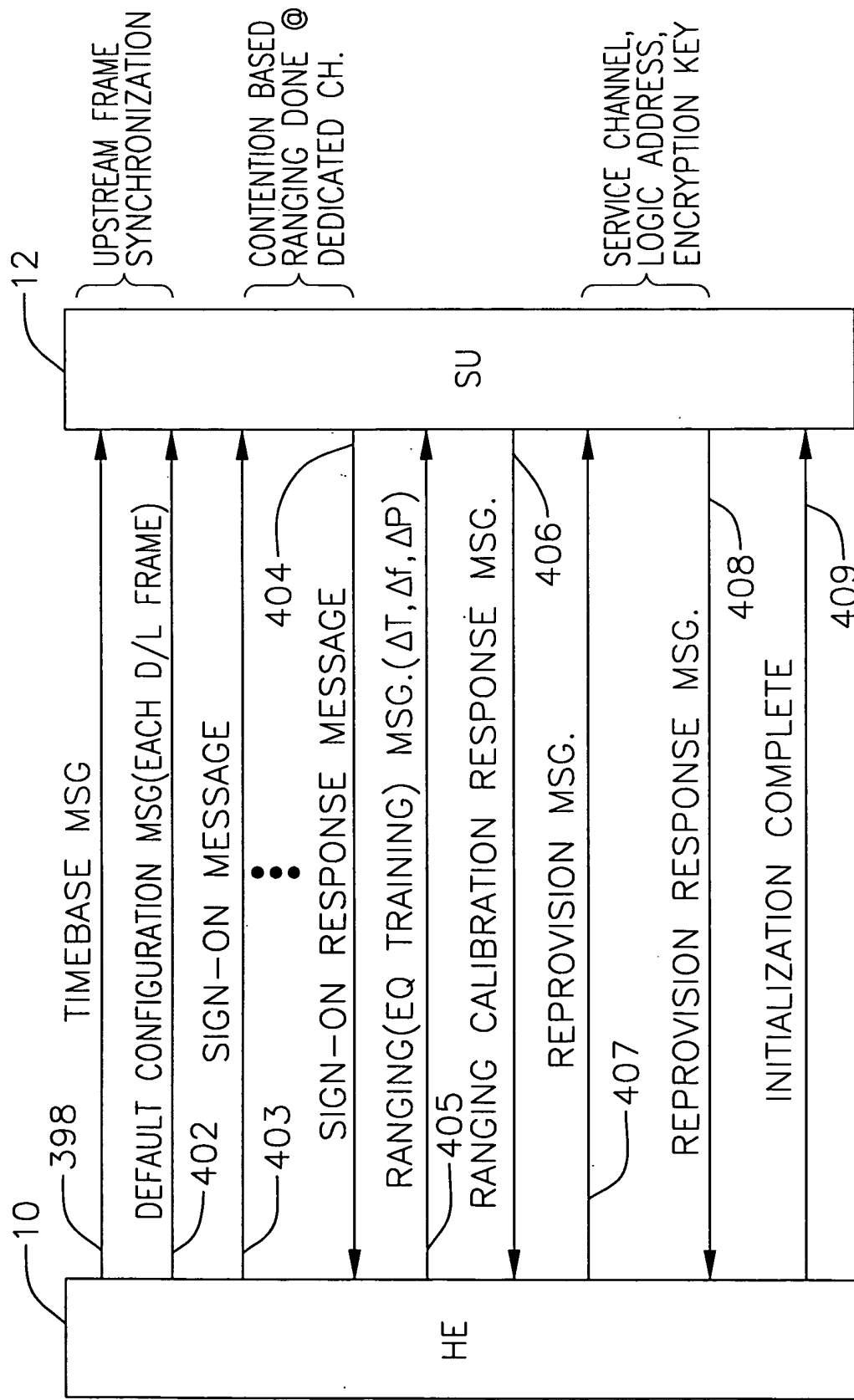


FIG. 61

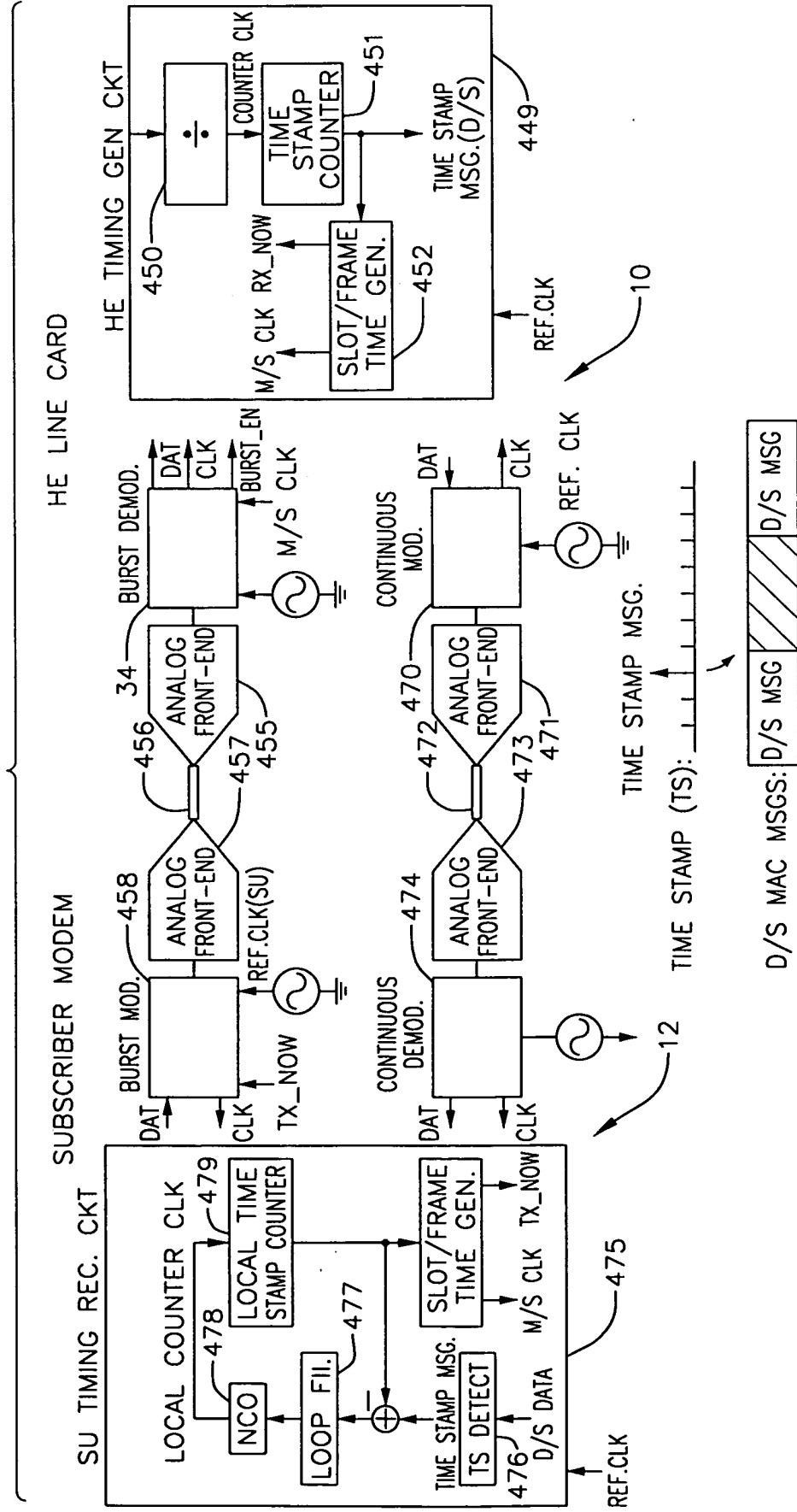


FIG.62

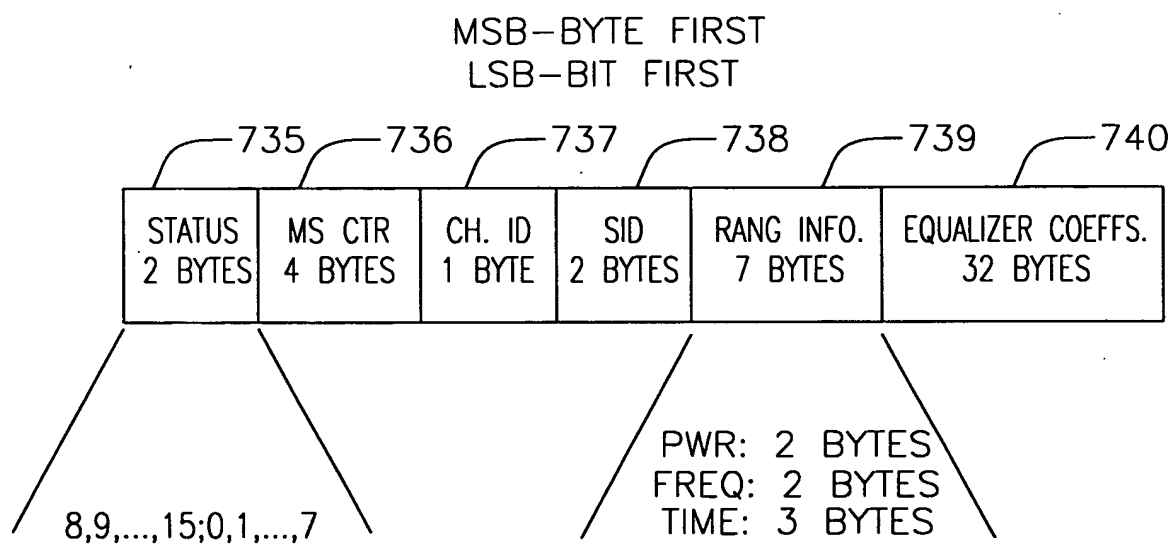


FIG. 63

BIT FIELD	DEFINITION IF BIT[11]=1	DEFINITION IF BIT[11]=0
BIT[15:12]	DOCSIS IUC	RESERVED
BIT[11]	1:INDICATES 1ST. BLOCK OF TRANSMISSION	0:INDICATES NOT 1ST. BLOCK OF TRANSMISSION
BIT[10]	1:INDICATES LAST BLOCK OF TRANSMISSION	1:INDICATES LAST BLOCK OF TRANSMISSION
BIT[9]	1:INDICATES RANGING REQUIRED	RESERVED
BIT[8]	RESERVED	RESERVED
BIT[7:5]	000:FEC OK 001:CORRECTABLE FEC ERROR 010:UNCORRECTABLE FEC ERROR 011:NO UNIQUE WORD DETECTED 100:COLLIDED PACKET 101:NO ENERGY 110:PACKET LENGTH VIOLATION	000:FEC OK 001:CORRECTABLE FEC ERROR 010:UNCORRECTABLE FEC ERROR 011:NO UNIQUE WORD DETECTED 100:COLLIDED PACKET 101:NO ENERGY 110:PACKET LENGTH VIOLATION
BIT[4]	1:VALID MINISLOT COUNT PREPENDED	RESERVED
BIT[3]	1:VALID CHANNEL ID PREPENDED	RESERVED
BIT[2]	1:VALID SID PREPENDED	RESERVED
BIT[1]	1:RANGING INFO PREPENDED	RESERVED
BIT[0]	1:EQUALIZER COEFFICIENTS PREPENDED	RESERVED

FIG. 64

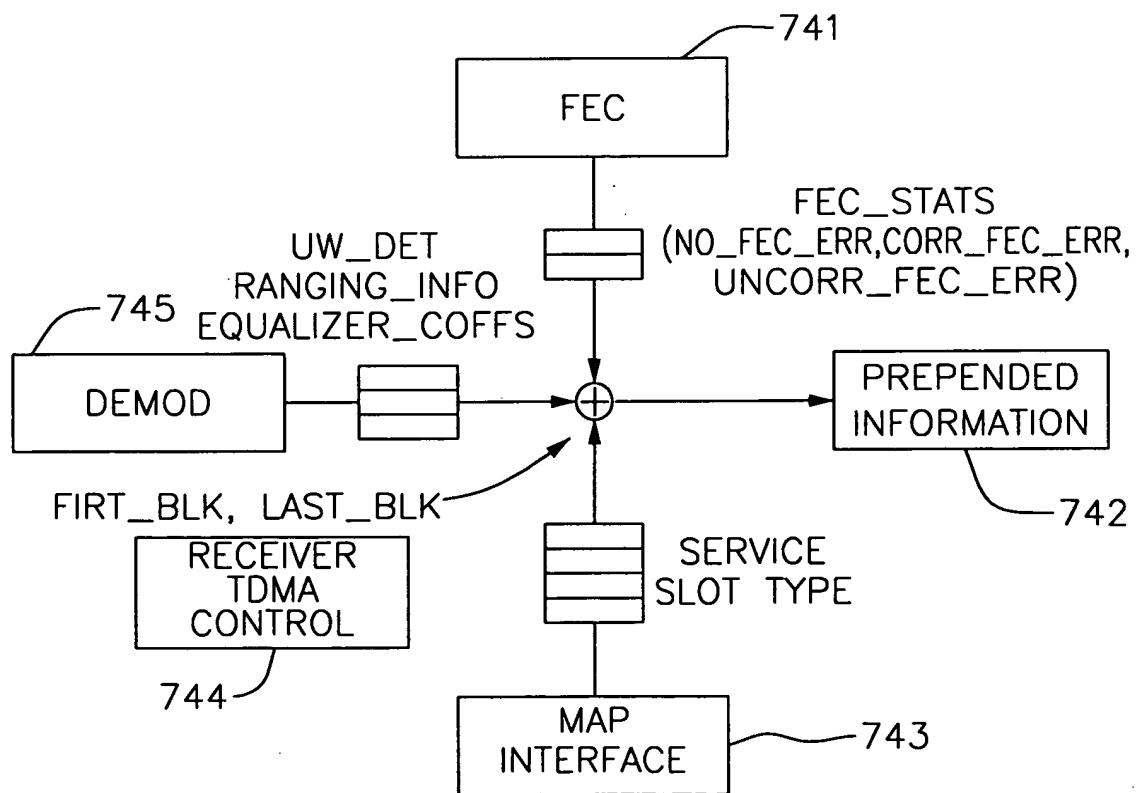


FIG. 65

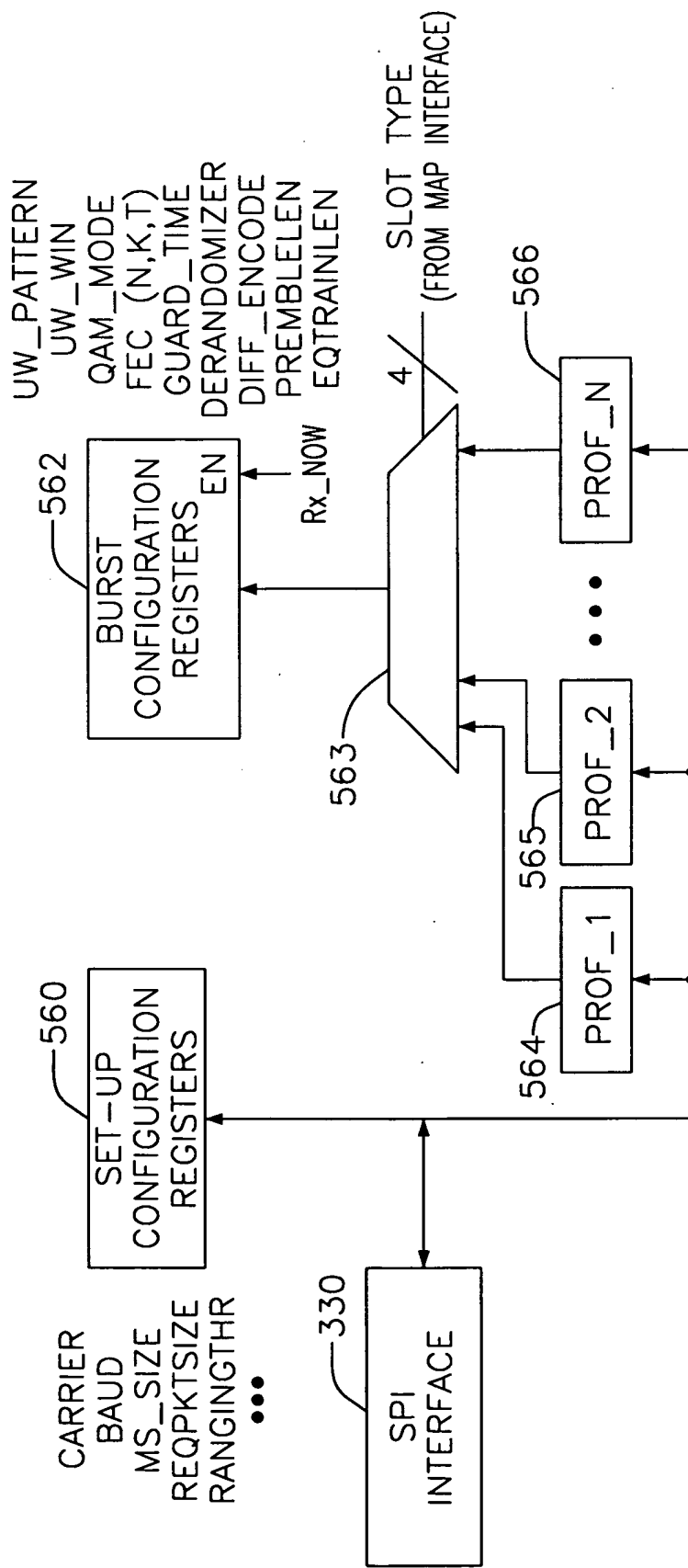


FIG. 66

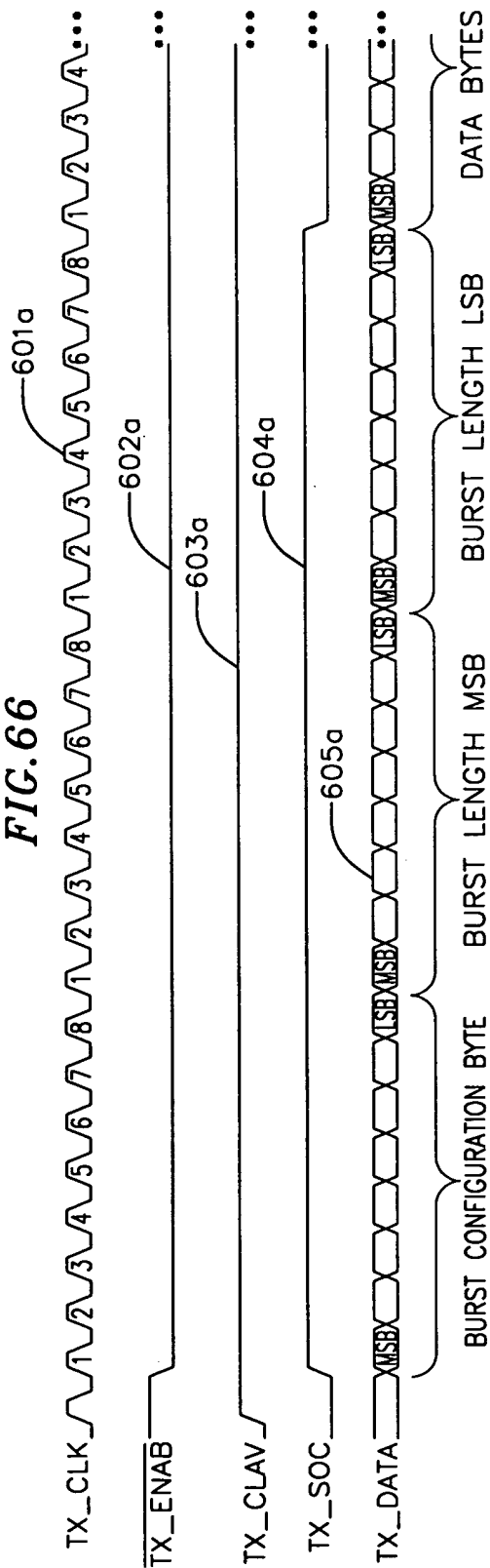


FIG. 67

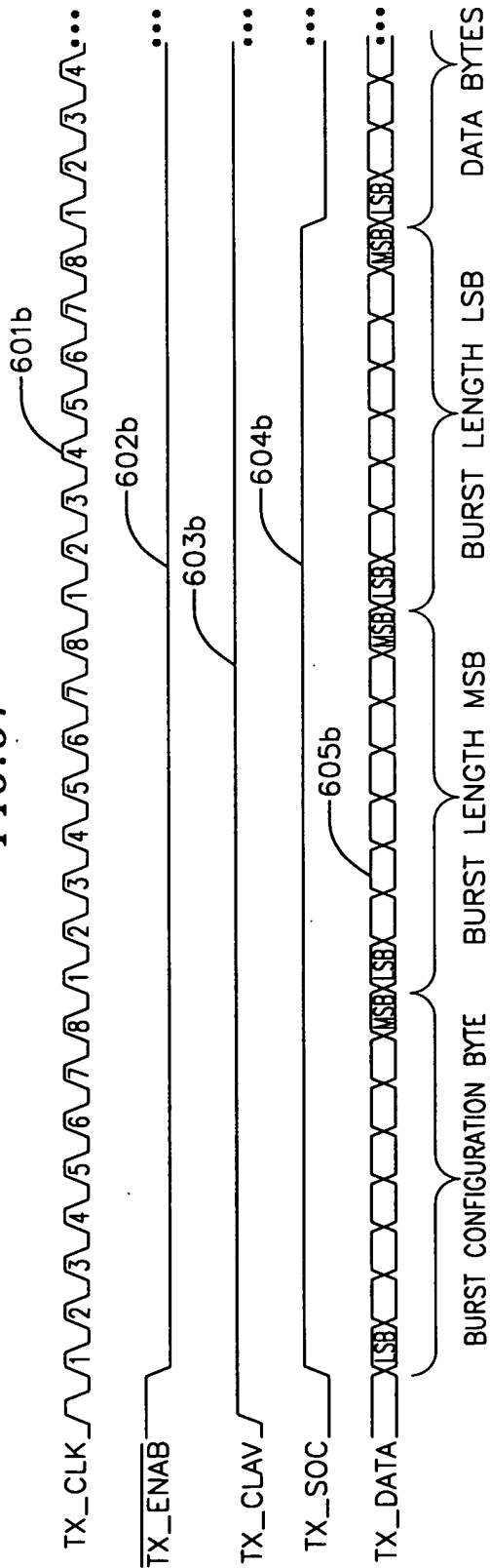


FIG. 68

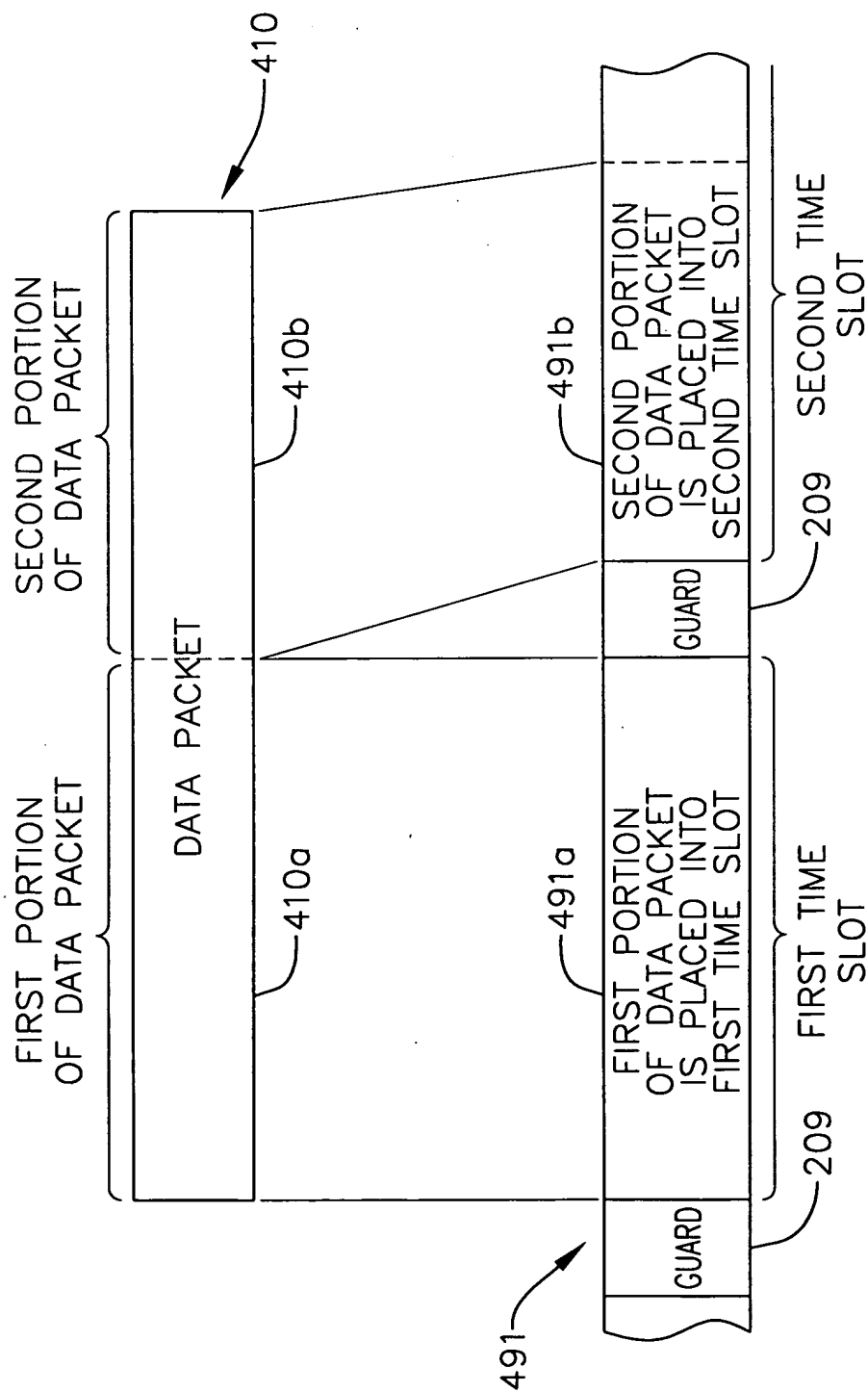


FIG.69

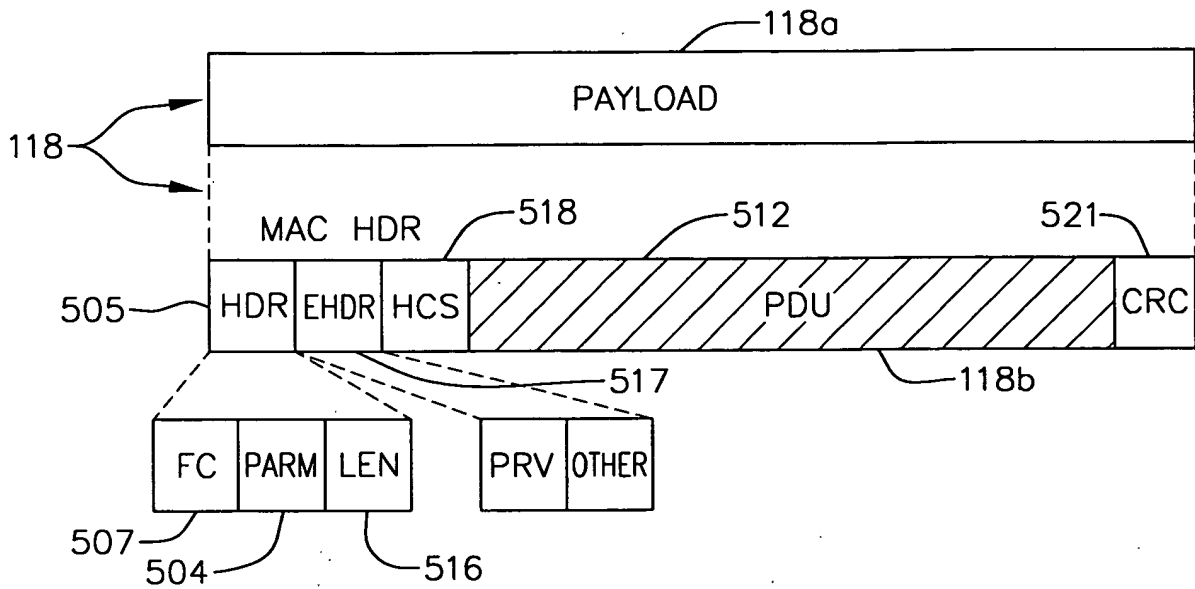


FIG.70

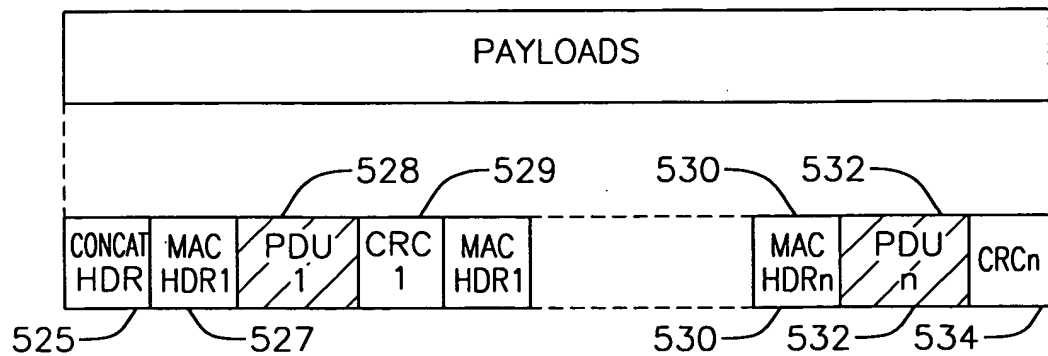


FIG. 71

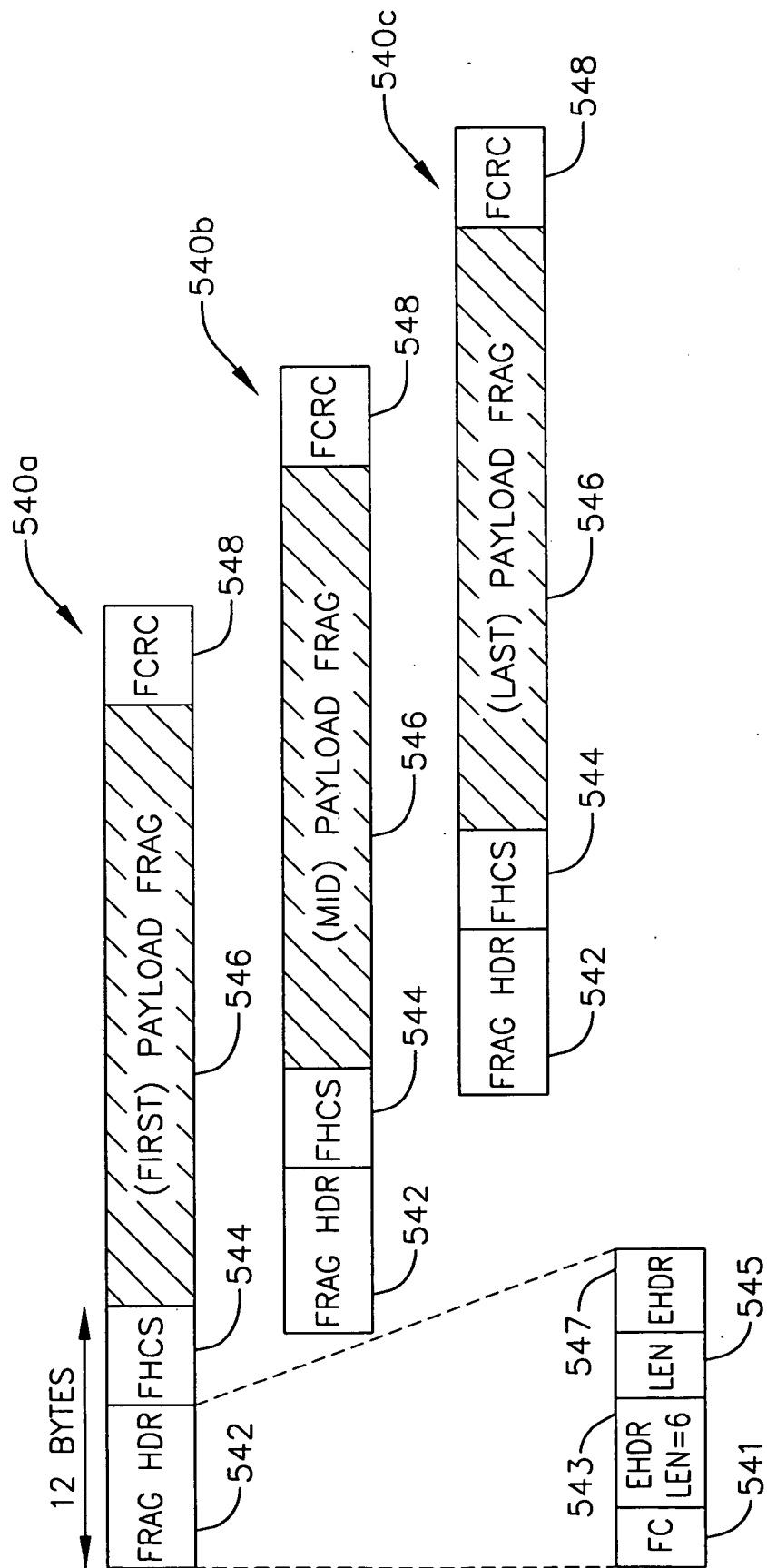


FIG. 72

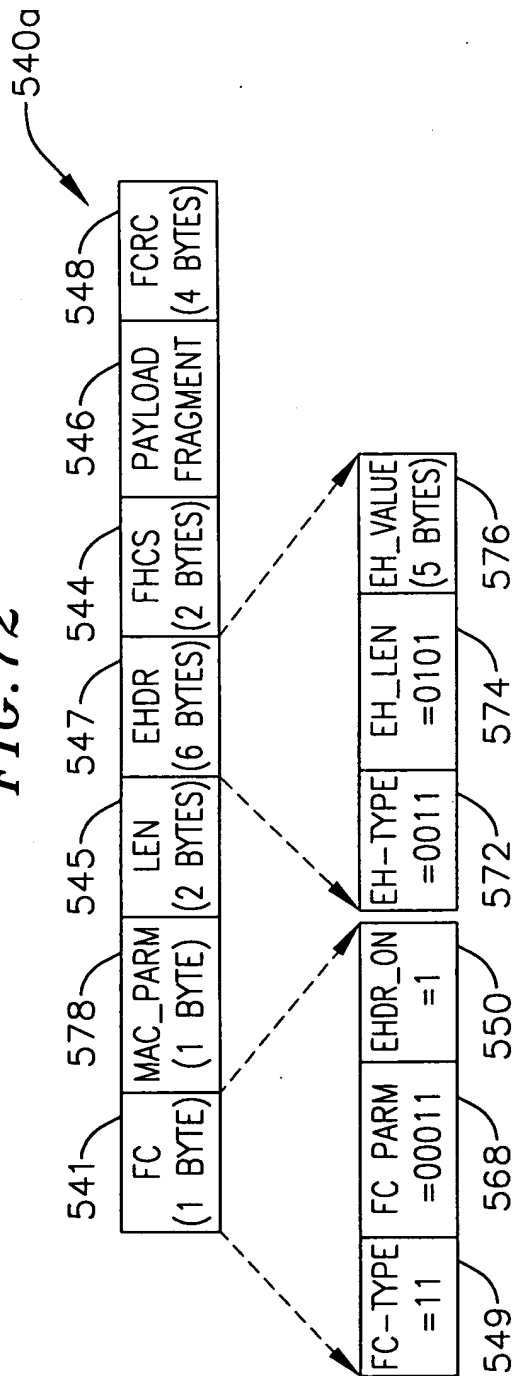


FIG. 73

FIELD		USAGE		SIZE	
FC		FC_TYPE=11;MAC-SPECIFIC HEADER FC_PARM [4:0]=00011;FRAGMENTATION MAC HEADER EHDR_ON = 1;FRAGMENTATION EHDR FOLLOWS		8 BITS	
MAC_PARM		ELEN = 6 BYTES;LENGTH OF FRAGMENTATION EHDR		8 BITS	
LEN		LEN = n+10;TOTAL LENGTH OF THIS FRAGMENT INCLUDING PAYLOAD, EHDR, FCRC		16 BITS	

FIG.74

FIELD	USAGE	SIZE
EHDR	EH_TYPE=3;SAME TYPE AS BP_UP EH_LEN=5;LENGTH OF THIS EHDR KEY_SEQ;SAME AS IN BP_UP VER=0001;VERSION NUMBER FOR THIS EHDR ENABLE IF ENABLE=0, BPI DISABLED IF ENABLE=1, BPI ENABLED TOGGLE BIT;SAME AS IN BP_UP SID;SERVICE ID ASSOCIATED WITH THIS FRAGMENT REQ;NUMBER OF MINI-SLOTS FOR A PIGGYBACK REQUEST RESERVED;MUST BE SET TO ZERO FIRST_FRAG;SET TO ONE FOR FIRST FRAGMENT ONLY LAST_FRAG;SET TO ONE FOR LAST FRAGMENT ONLY FRAG_SEQ;FRAGMENT SEQUENCE COUNT, INCREMENTED FOR EACH FRAGMENT, SET TO ZERO FOR FIRST FRAGMENT	4 BITS 4 BITS 4 BITS 4 BITS 1 BIT 1 BIT 14 BITS 8 BITS 2 BITS 1 BIT 1 BIT 4 BITS
FHCS	MAC HEADER CHECK SEQUENCE	2 BYTES
PAYLOAD	FRAGMENT PAYLOAD;PORTION OF TOTAL MAC PDU BEING SENT	n BYTES
FCRC	CRC ACROSS FRAGMENT PAYLOAD	4 BYTES
	LENGTH OF A MAC FRAGMENT FRAME	n + 16 BYTES

FIG. 75

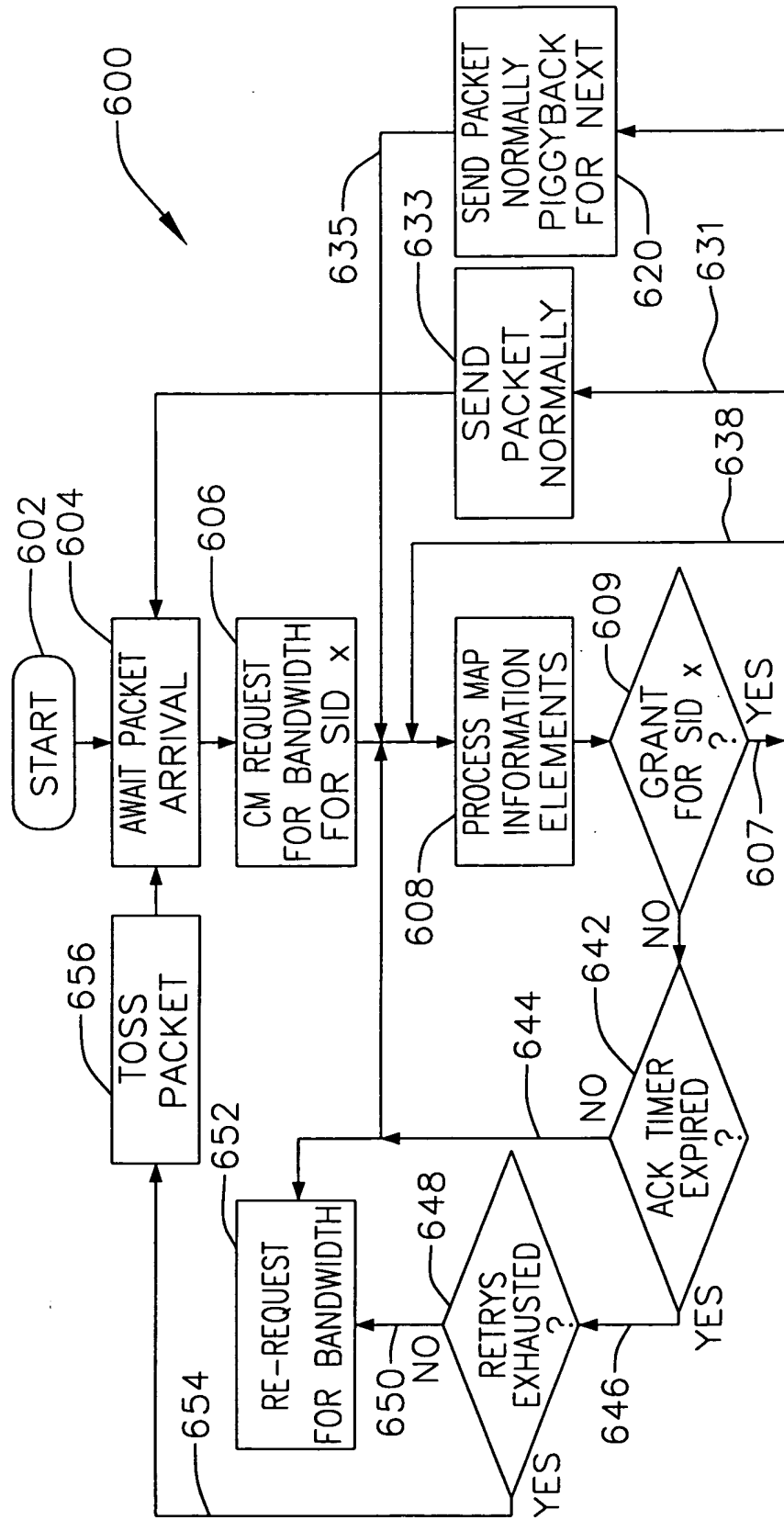
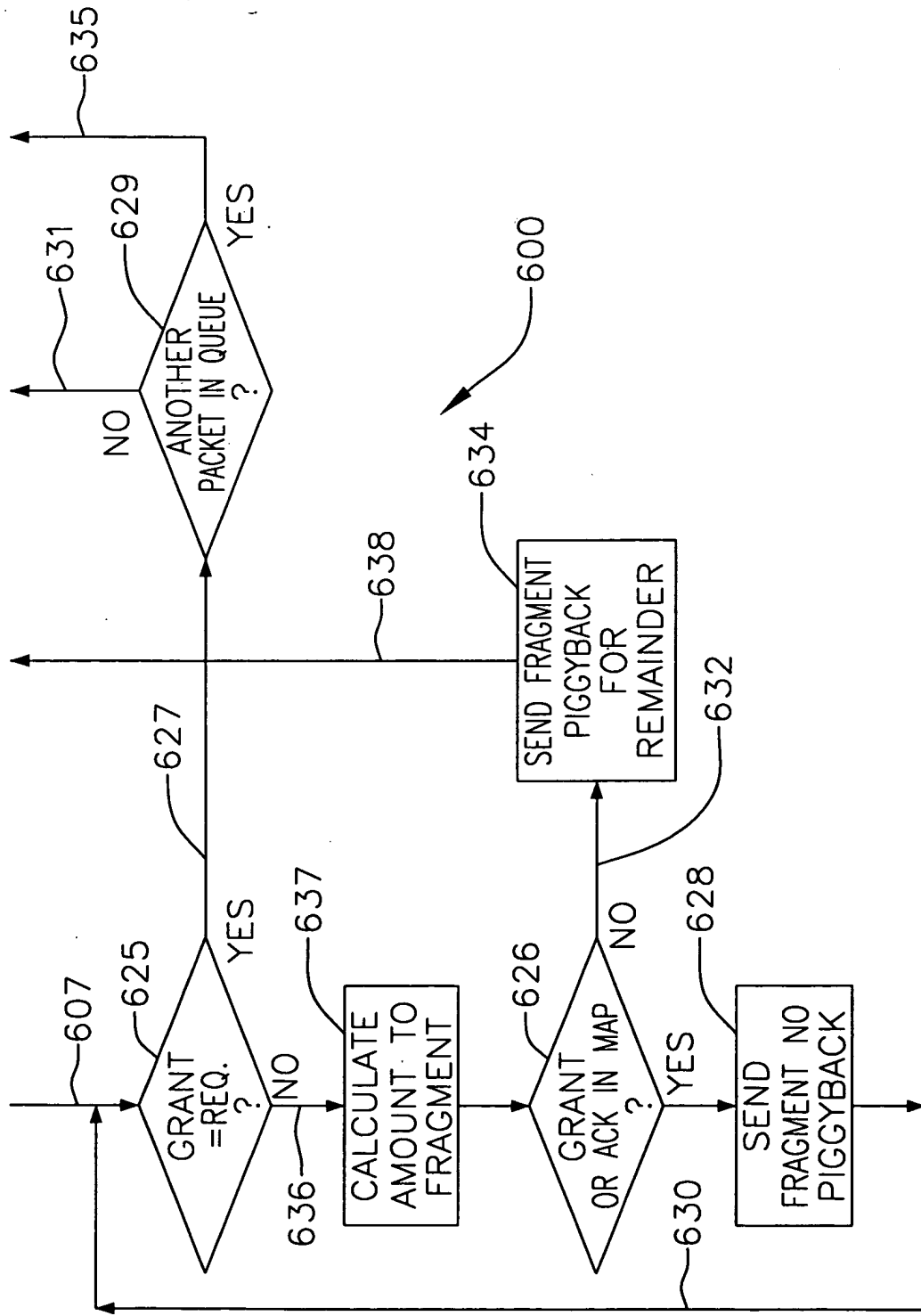


FIG. 76



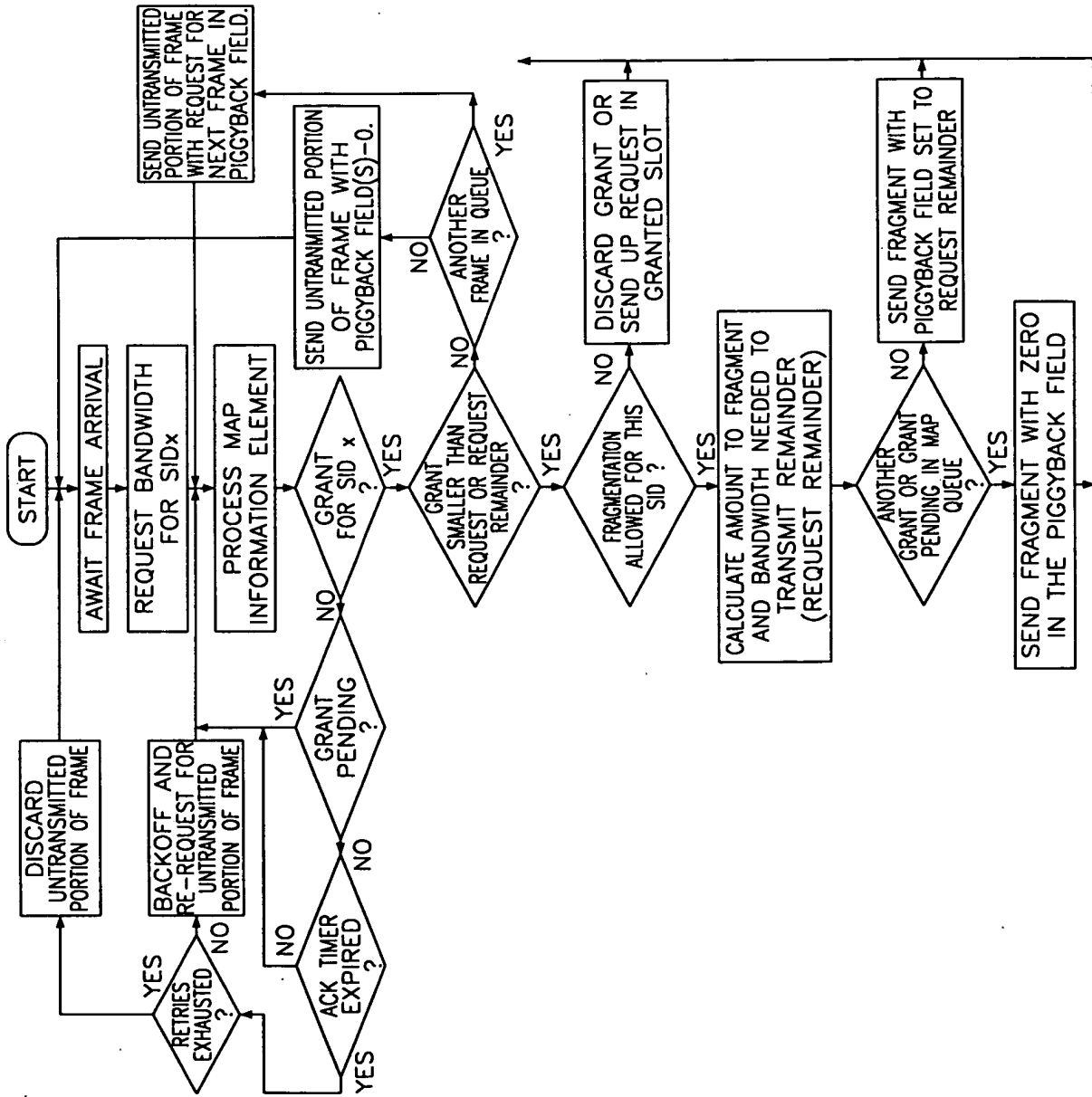


FIG. 77

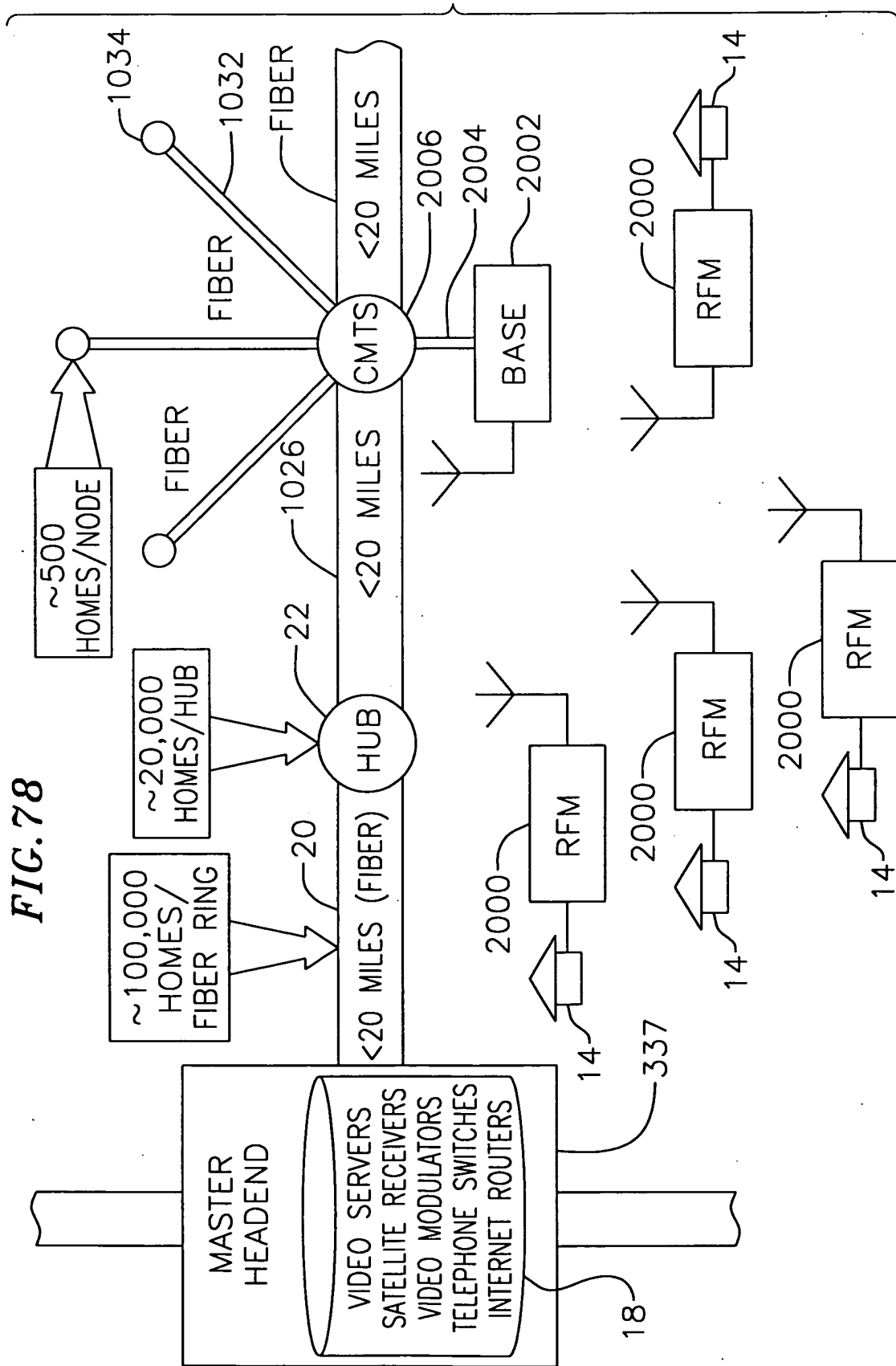


FIG. 79

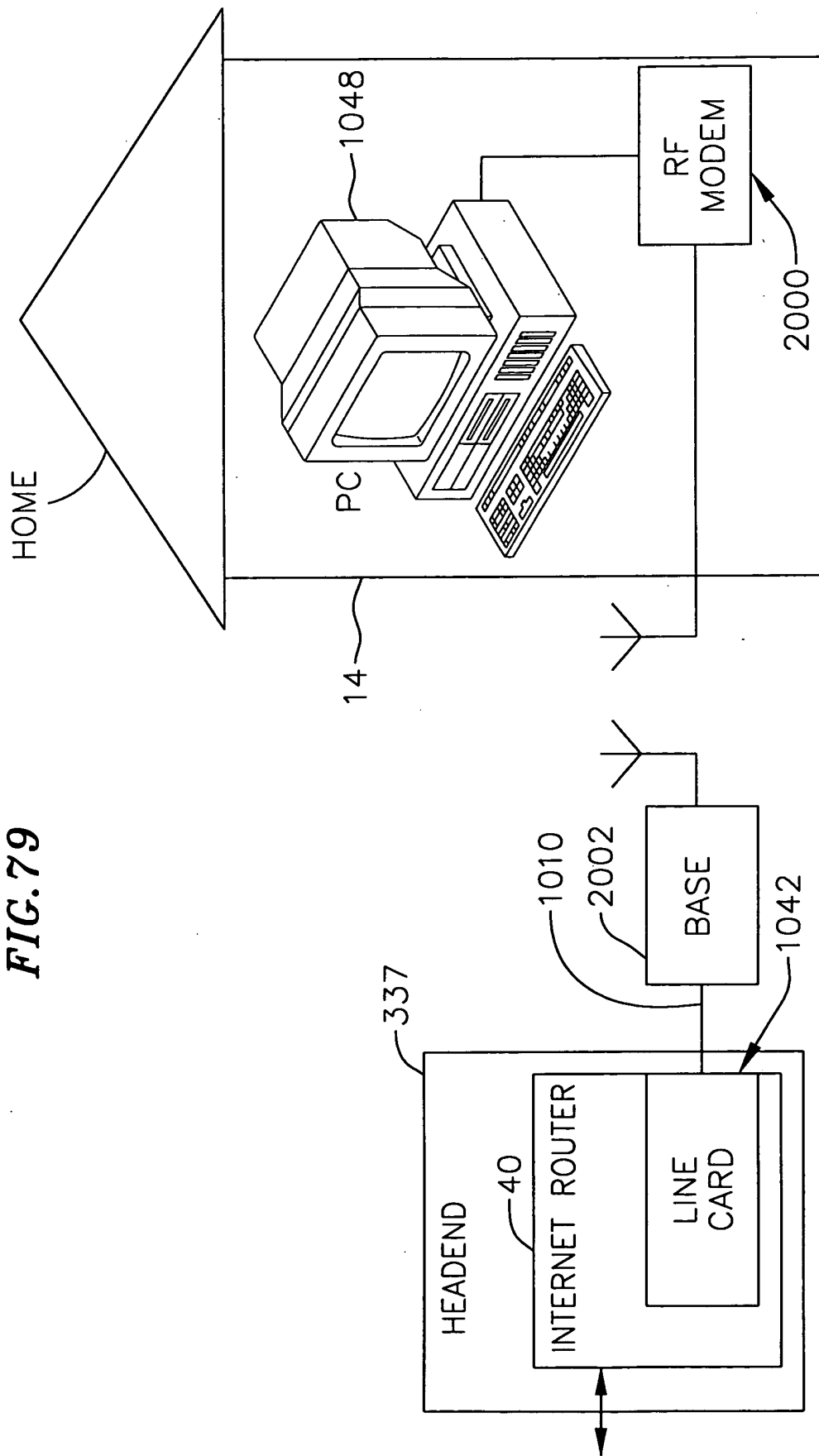


FIG. 80

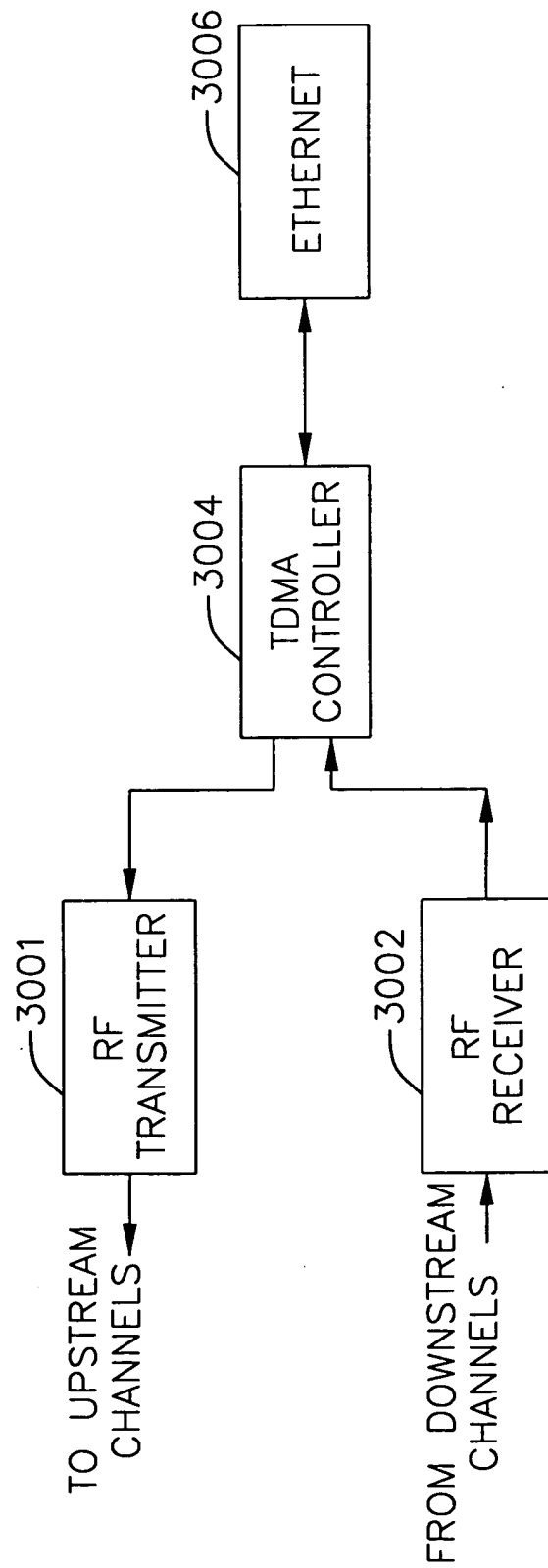


FIG. 81

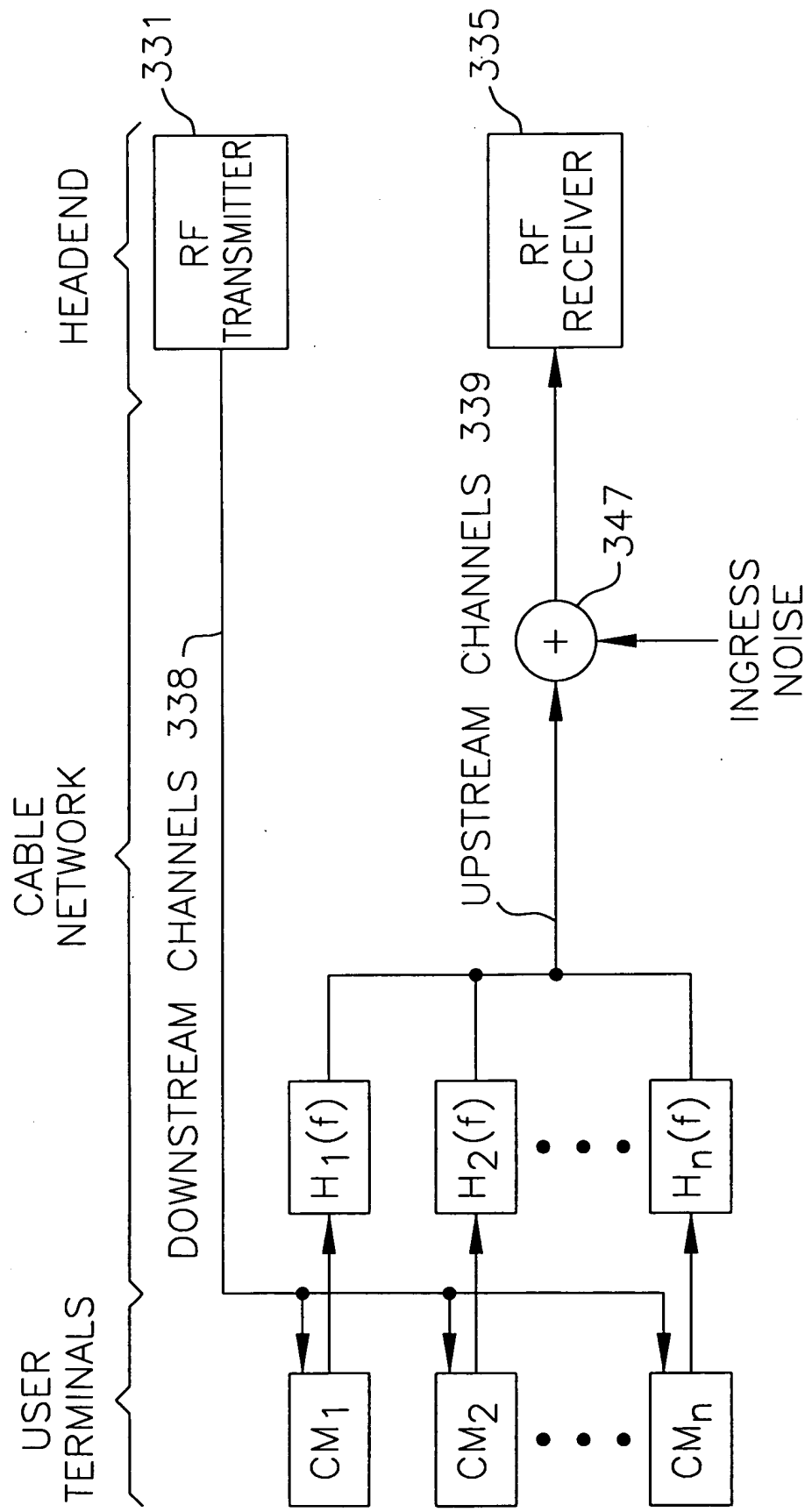


FIG. 82

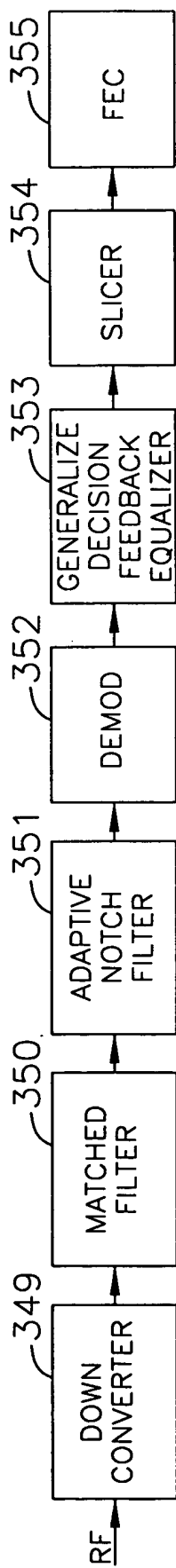


FIG.83

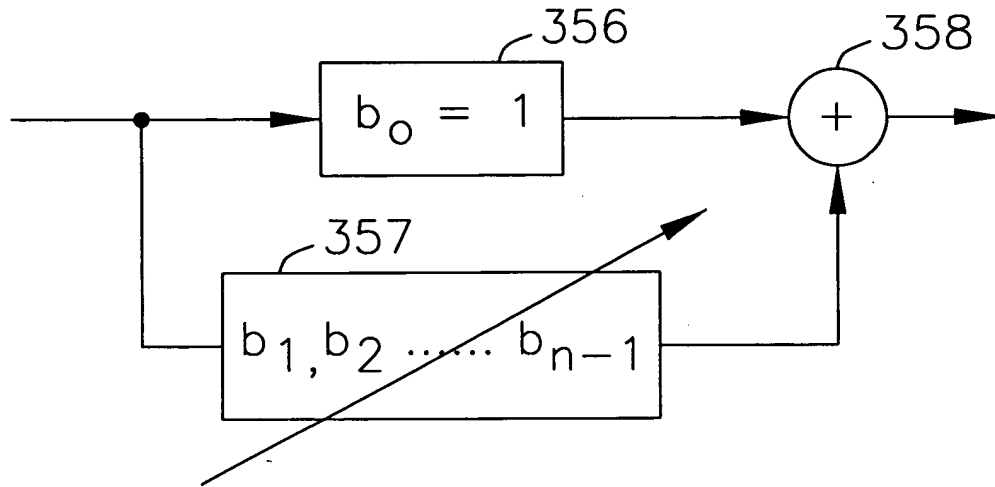


FIG.84

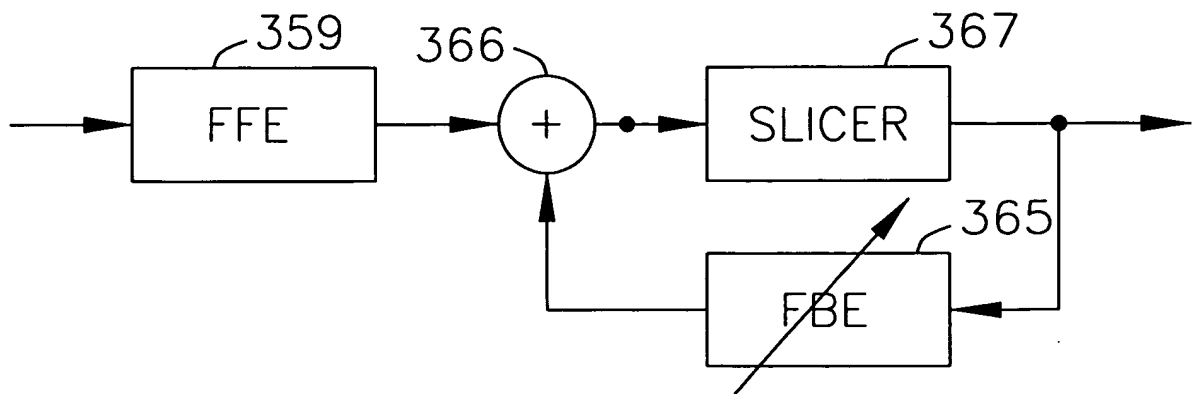


FIG. 85

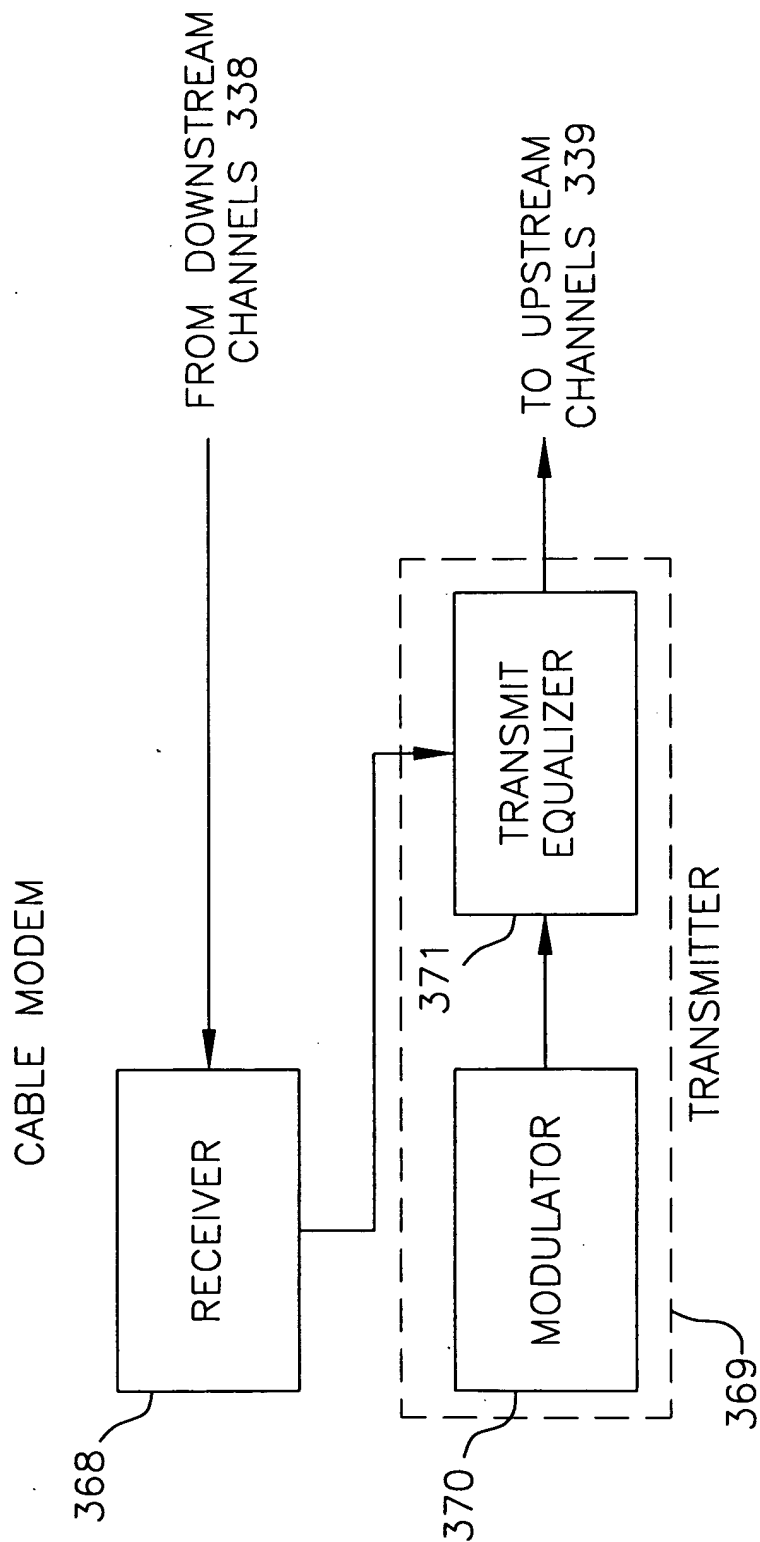


FIG. 86

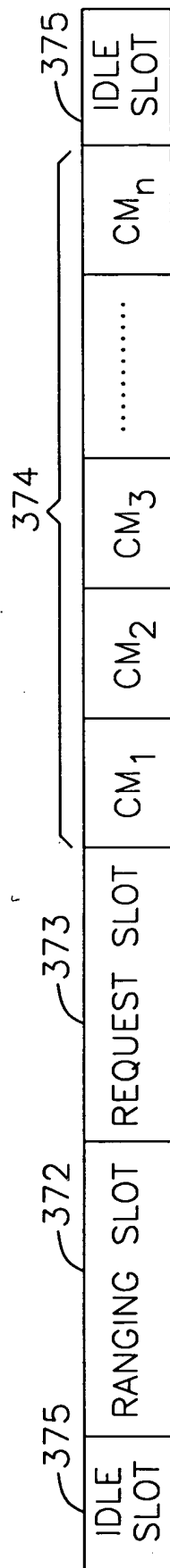


FIG. 87

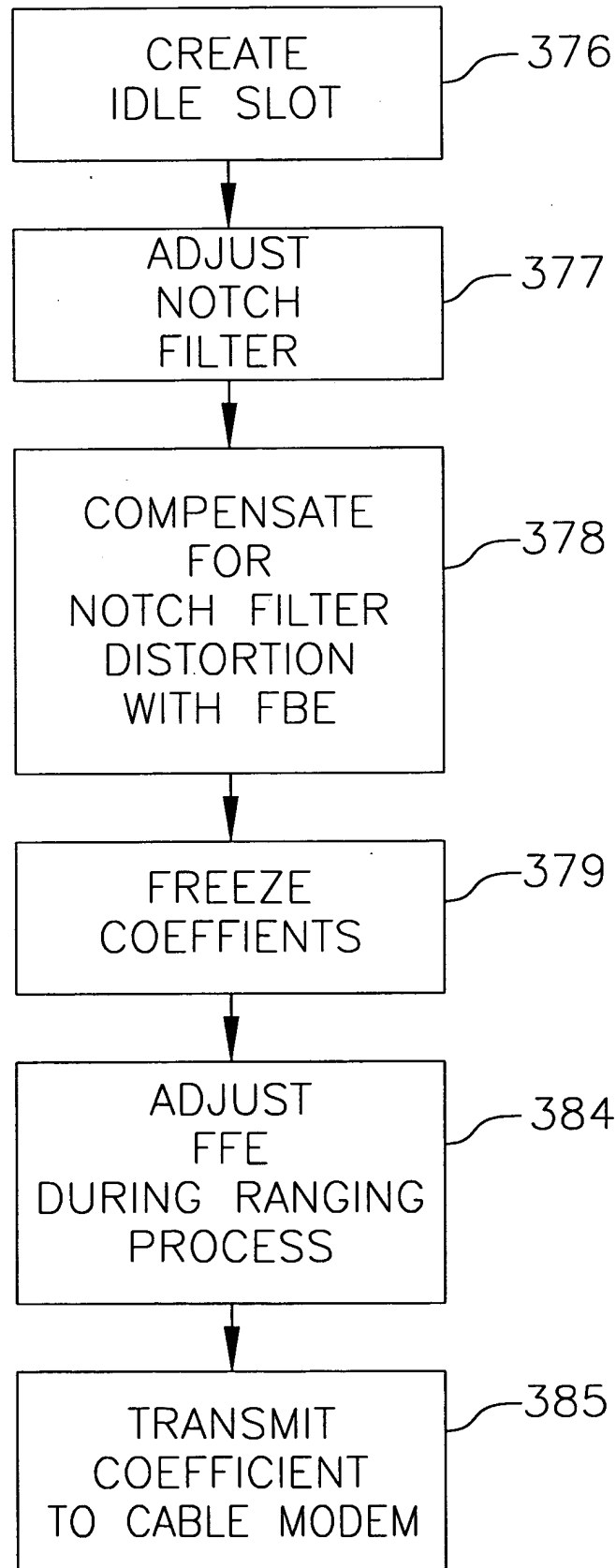


FIG. 88A

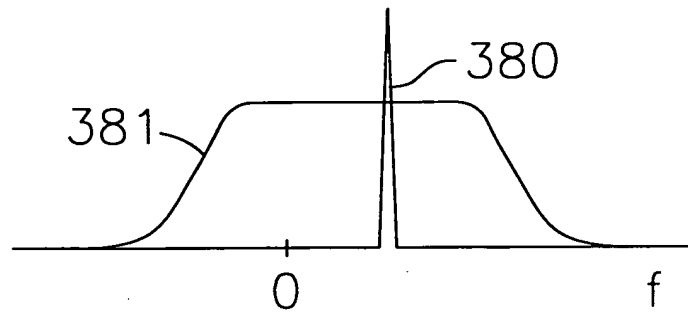


FIG. 88B

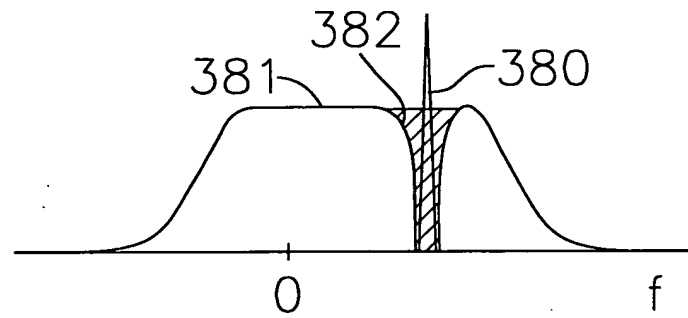
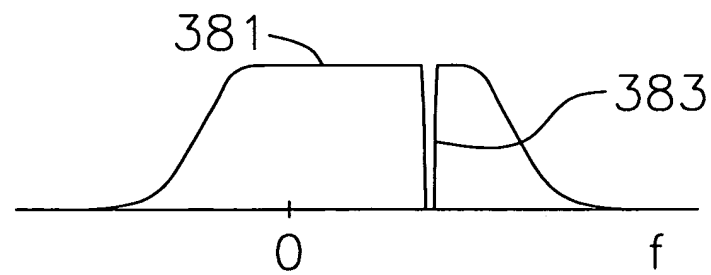


FIG. 88C



[illegible][illegible]

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100	

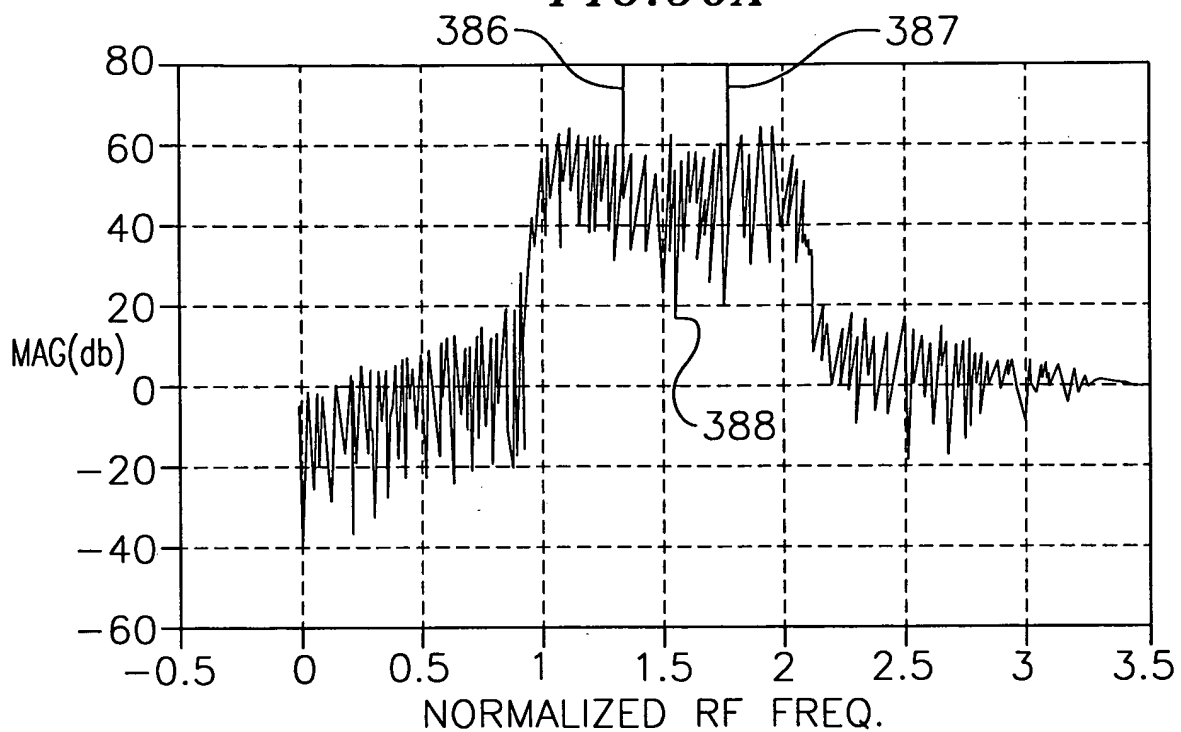


FIG. 90B

